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BATES COLLEGE

LEWISTON, MAINE

GYMNASIUM

MANUAL

Prescription of Exercise

Arranged by

W. W. BOLSTER, JR., A.B.,

Director of Physical Training

Instructor in Physiology and Hygiene

FOR MR. _____

DATE _____ CLASS _____



BATES COLLEGE
LEWISTON, MAINE

GYMNASIUM MANUAL

And PRESCRIPTION OF EXERCISE

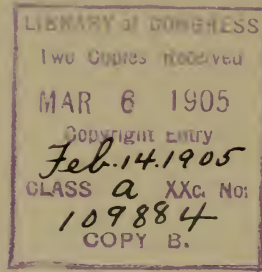
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Instructor in Physiology and Hygiene

1905



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FEBRUARY 14, 1905,
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JOURNAL PRESS, LEWISTON, ME.

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Introduction

The object of this manual is to explain to the students of Bates College the general laws of hygiene and rational exercise.

The aim of this department of Physical Training is to improve the *health* and *efficiency* of the students; to give them that *symmetrical development*, *organic power*, and *bodily control* so necessary to the success of the educated man.

The sedentary habits of students render hygienic *gymnastics* and *athletics* imperative for all students, if health, which is the perfect co-ordination of all the organs, is to be maintained.

This manual contains a chart which will enable each student to know how his development and organic power compares with that of the average man. It also contains directions on *Personal Hygiene* and *Exercise*, and a series of exercises and directions for the correction of deficiencies in development and function; these exercises include chest weights; special developing appliances; class drills, containing many of the fundamental movements necessary for hygienic exercise; and other information which will be of assistance to students using the gymnasium. Each student entering the Freshman Class will be given a copy of the manual, with his measurement and strength tests plotted on the chart, with such specific advice as will enable him to maintain normal health.

The author presents no new or original system of movements and directions in this Manual but has endeavored to arrange a pamphlet that will be of practical value to the students of Bates College.

The author wishes to thank Dr. Wm. W. Hastings, of the Y. M. C. A. Training School at Springfield, Mass., for the use of his anthropometric chart with directions and permission to quote extracts from his manual; Dr. S. P. Beebe, Loomis Laboratory, New York City, for corrections and suggestions in the Diet Table; Dr. D. A. Sargent for exercises on Special Developing Appliances and chest weights; Dr. F. N. Whittier of Brunswick, Me., for aid in arranging the Broadsword and Foil drills; Mr. William T. Foster of Brunswick, Me., for suggestions and corrections of final proof; Mr. Edwin S. Conner and Mr. Ross M. Bradley for aiding in preparation of the illustrations.

Any student wishing more information will find a Bibliography in the last part of the book.

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Information Regarding Use of the Gymnasium

The Director of Physical Training gives **Physical Examination** each young man entering the Freshman Class a thorough physical examination during the first term of his attendance at college. His physical measurements are recorded, his strength tested, his heart, lungs, eyes, ears and teeth examined, and his general health inquired into. All abnormalities and physical defects, such as flat chest, uneven shoulders, round shoulders, spinal curvatures, rupture and bad postures are recorded. On the basis of this examination, advice is given as to the kind and amount of exercise best adapted to his needs. Re-examinations, or second strength tests alone, may be taken at the request of the student on the advice of the Director. The measurements and strength tests taken are plotted on chart contained in this manual, which shows how the student compares with the average young man.

Lockers may be secured by applying to the janitor, and depositing fifty cents for a key. Any difficulty with the lockers should be reported to the janitor at once.

Locker Rules *Money, watches and other valuables* must not be left in the lockers, bath-room, or locker room, as the college does not hold itself responsible for them.

Articles found in lockers, bath-rooms or *gymnasium* should be left for identification at the Physical Director's office.

Gymnasium Floor *During class hours* the floor is for the *exclusive use* of the class. Students will not be permitted to do any individual work during class hours.

Students not exercising will be considered as visitors. Visitors require special permission from the Director to go on the gymnasium floor.

Students should not attempt any *dangerous feats* unless under the personal direction of the Director.

Rubber-soled shoes or *regular gymnasium shoes* must always be worn on the gymnasium floor.

Spitting on the floor or walls of any room is not gentlemanly or *hygienic*.

The use of tobacco in the gymnasium is prohibited.

Any student wishing to use the gymnasium at hours when there is no regular work may do so by securing permission from the Director.

Gentlemanly deportment and language are expected from all students in the gymnasium.

Any disputed matter not covered by the regulations should be referred to the *Physical Director* for adjustment.

All movable apparatus and mats must be returned to their place after use. No apparatus may be taken from gymnasium without special permission from the Director. Medicine and basket balls must not be thrown or kicked against apparatus or lights.

Use all apparatus with care; remove finger rings while using striking bags or bars.

Gymnasium Costume

All students exercising during class hours are expected to wear regulation suits. A light weight worsted shirt, garnet or navy blue, and long gray trousers are recommended for general use. The wearing of torn, soiled, or otherwise improper costume is not permitted on the gymnasium floor.

Gymnasium clothing and shoes should be *carefully marked* for identification.

Prescribed Courses

Three hours a week of work in the Gymnasium are prescribed for all members of the three lower classes in the college. The physical examination is required of all students entering college, and at such other times as the Director may think necessary.

The work prescribed for these classes has been arranged with a view to securing three objects: First, *health and organic vigor*; second, *bodily control and efficiency*; third, *erect carriage and symmetrical development*. It consists of marching and free movements or setting-up exercises executed simultaneously by the whole class each day. Free movement hand apparatus as follows: Freshmen, Indian-clubs; Sophomores, Dumb-bells; Boxing; Juniors, Single Sticks and Broadwords; Apparatus and mat work in graded squads, under student leaders; and gymnastic games.

**Credit for
Physical
Training**

Physical training is closely associated with and fundamental to *mental training*.

Montaigne says, "We have not to train up a soul nor yet a body, but a man, and we cannot divide him." Athletics and gymnastics develop certain mental and moral qualities needed by the educated man of to-day. Partly to encourage men to come out for athletics, and inasmuch as it is consistent with the aims of the course, credit is allowed for athletic work in the college. Students may offer athletic training in the several sports as equivalent for *one-half* of the prescribed gymnasium work; but attendance *must be reported weekly* by the captains or managers of the teams. Athletics do not excuse a man from the required physical examinations. *Credit for gymnasium and athletic work counts for a degree.*

**Absences and
Excuses** *All absences from gymnasium work must be made up on Saturdays or such other time as the Director may appoint. Excuses for illness*

must be presented to the Director in person, and should be accompanied by a physician's certificate giving the cause and period of sickness. Excuses accepted by the Director allow the student to make up the exact period of his absence, but do not in all cases permanently excuse him from attendance.

At the discretion of the Director, the following students upon application may be excused from all or a part of their gymnastic exercises: (a) Students living in Auburn and boarding at home; (b) Students performing manual labor six to ten hours per week; (c) Students who have won the College B. Students who have been absent from college by permission of the President will not have to make up gymnastic exercises lost during absence. **ALL STUDENTS WISHING TO BE EXCUSED MUST REPORT TO THE DIRECTOR BEFORE GYMNASIUM WORK BEGINS.**

**Time of
Attendance** *Physical examinations of the students occupy the first six or eight weeks of the academic year. The regular class work begins about the first of November and extends to about the first of*

April. All students are expected to take regular out-door exercises before gymnastic exercises begin and after the regular in-door work closes in the spring.

Value of Exercise A student's success depends quite as much on the health of his body as on the integrity of his mind. There is no part of the mental training that the college man receives that is independent of the support of the body.

The student has need of greater strength and health of body than the artisan, because mental work is severely exacting and physically expensive. It is, therefore, necessary that the student keep his body in the best condition.

The amputation of a limb, especially in young persons, leads first to enfeeblement and then to actual degeneration of the nerve-cells in the spinal cord which are connected with it. In course of time, even the corresponding group of nerve-cells in the brain show unmistakable signs of wasting or atrophy. If this loss of activity in the limb causes degeneration or atrophy, activity or exercise must aid in the development of these centers.

Practice Follow faithfully any special prescription if you would obtain results. Emphasize all directions checked (✓). Deformity, debility and disease are the product of *years of carelessness*. Symmetry, strength and health must be the product of months, at least, of *care*.

Regularity Be *regular* in your exercise, eating, sleeping, recreation, and all other hygienic habits. There is physiological economy in it. Irregularity and lack of system will lose you half the possible results. "How use doth breed habit in a man."

Beginning Work To avoid *soreness*. The *first day* take not more than half an hour of very light exercise. *The first week* take in all three half hours on three different days. Increase gradually in amount and vigor of the exercise. The best thing for soreness is more light exercise and massage.

Colds *Exercise does not develop colds. That which you do after exercise is responsible for them.* Do not *stand around* long after exercise before you bathe. Avoid drafts and sudden cooling when in perspiration. Use a graded bath. During cold weather make a point of spending a few minutes in the building after dressing. Protect your chest well and breathe through the *nose* when you go out-doors. In cold weather never wear *stockings* or *under-*

clothes after using them while exercising, as the dampness may cause a cold.

Hygienic Habits

Diet, rest and exercise are alike responsible for *health*. Study the laws governing each and work out the scheme of living best *adapted to your own case*. No one set of rules can be stated for all.

The Best Exercise

The question is often asked, "*What is the best exercise?*" No perfectly definite answer can be given. Among athletic sports those which bring equally into play the upper and lower limbs (as wrestling, swimming and rowing with two oars and a sliding seat, boxing and fencing) are the best. In scientific gymnastics, setting-up exercises or "Swedish movements" appear to be the best and most complete.

Personal Hygiene*

"The first requisite to success in life is to be a good animal." "Health, strength and vitality do not come by chance, but by obedience to natural laws. Study health. Select at least a half dozen principles which you will obey, and hold to them rigidly. Form at least as many correct life habits.

Breathing

Oxygen is as essential to life as is food. It purifies the blood. Light, shallow breathing means imperfect filling of the air cells and incomplete aeration of the blood. The legitimate result of each-disuse is degeneration of lung tissue and ultimate disease.

Respiration should be deep and full. Breathe through the nose. Mouth breathing is allowable only under stress of heavy exercise. Practise breathing exercises in connection with your walking, running and other athletics and gymnastics. Take long, deep breaths whenever you are out of doors. Take special breathing exercises for from five to ten minutes out of doors or before an open window upon rising in the morning and before retiring. You will find it a good tonic. Lay the emphasis upon abdominal breathing. Breathing exercises may first produce diz-

*Extract taken by permission from the Manual of William W. Hastings, M.D.

ziness. This is due to overstimulus of unused lungs. Lighten the amount of breathing exercises and continue them daily.

Ventilate your room day and night. Cover well and sleep with *windows open* even in winter.

Breathing exercises improve the carriage, increase the strength of the lung tissue, the size of the lungs and the size of the exterior chest, and give flexibility to the chest walls. Fullness of life and plenteous supply of oxygen are inseparably associated. There is no "Air Trust." Air is free. Use it.

A well-balanced circulation is a desideratum **Circulation** not to be despised. Local congestions give rise to many difficulties. The causes of these congestions are many and the points of interruption of the circulation various. *e. g.*, congestion of blood in the head may result in insomnia, headache, etc., from oversupply of blood in that part of the body, and in digestive troubles, cold feet, etc., from undersupply in another part.

One point of view must obtain for the application of all kinds of remedies, the *equalization of the circulation*. For example, note the general character of the remedies suggested below for insomnia: "A warm bath," "general massage," "breathing exercises," "a short run or a long walk followed by a light hand bath and a rub down." The effect of each one of these remedies is to remove the congestion of blood from the head and to equalize the circulation.

The best remedy for almost every disturbance of circulation in a person of average strength is light general exercise of some kind, long continued. Even a weak, irregular heart often yields to this kind of treatment. When vigorous exercise is taken, finish with lighter exercise to equalize the circulation before the bath.

The *skin* is important as an organ of *excretion*, but its greatest function is the regulation of the *body temperature*. Hence the great necessity for keeping it clean and active. The best bath for general cleanliness is a warm tub bath with free use of soap lasting from ten to twenty minutes. This should be taken once a week unless the sponge, shower, spray or plunge bath occurs daily.

The sponge, shower or spray bath should be *graded*, beginning tepid or warm and cooling slowly until there is an agree-

able shock. It should last not over two minutes. A vigorous rub down with a rough towel which follows for about five minutes should induce a pleasant reaction and a feeling of exhilaration. If no such feeling of exhilaration follows, the bath was improperly given or was not adapted to your condition.

For the healthy and vigorous, the graded bath is best closed with the plunge. This should last not longer than from five to fifteen minutes. The duration is altogether dependent upon the individual. The sponge, shower, spray or plunge are stimulating as well as cleansing, the latter being the most enjoyable and effective.

Avoid hot baths, cold plunges (especially before breakfast), the Russian, Turkish, or any other radical therapeutic use of water without the advice of the physical director or your physician. There is nothing better, however, for the regulation of temperature and the equalization of circulation than the rational use of water under proper direction. Baths are classified as *cold* under 65 degrees F.; as *cool* from 65 degrees to 80 degrees F.; as *tepid* from 80 degrees to 92 degrees; as *warm* (neutral 92 degrees to 95 degrees) from 92 degrees to 98 degrees; and as *hot* above 98 degrees. The benefit of a bath depends upon temperature of the room as well as upon temperature of the water. See that the room is from 70 degrees to 78 degrees F.

The best time to bathe is immediately after exercising. Do not cool off before bathing. A light, cool hand or sponge bath with a vigorous rub down upon rising or retiring is a good tonic for many. If healthy and vigorous, try it—if you do not secure a good reaction, discard it as not adapted to you. Never take a cold bath when exhausted, out of breath, within two hours after a full meal or just before such a meal. In cold weather wait about ten minutes after a bath before going out of doors. The more frequent the bath, the shorter it should be. Rub vigorously after a cool bath, secure a fine glow, become thoroughly alive.

Clothing properly adapted to season, climate and occupation is *intended as an aid in the regulation of body temperature*. Improperly used it gives rise to all forms of local congestion, prominent among which are colds in nose, throat and lungs and all forms of chronic catarrh.

To avoid troubles rising from exposure to sudden changes of temperature, it is best to wear *light woolen or silk underclothing summer and winter*. This weight and quality of fabric is best adapted to meet bodily changes in body temperature due to amount of activity. Meet the changes in season and climate by the addition of outside clothing. In the winter the majority of men spend the greater part of the time indoors. Heavy underclothing is apt to induce undue perspiration and to render one liable to catch cold when exposed to a sudden draft or to the raw air outside.

For *Gymnasium Clothing* use a light to medium weight of woolen goods, white or fast colored; this absorbs the perspiration better than cotton and protects better from sudden changes of temperature. The best general combination is a shirt with long or quarter sleeves, "Turner" trousers, and low canvas shoes with rubber soles or with soft leather shoes without heels. Shoes should be easy. Keep the feet dry and warm. Do not wear a tight belt or tight clothing, especially during exercise. It restricts circulation.

For *athletic contests* when track pants or tights and trunks are used, still keep a light woolen shirt over the chest, and while standing around during a contest wear a woolen sweater to avoid catching cold.

Rest is as essential as food. Instead we rob
Rest *rest and murder sleep.* After meals there should be from fifteen to thirty minutes of rest, and there should be no close mental application for the same length of time before retiring.

Sleep from six to nine hours, according to age and the requirements of the individual organism. Men under twenty usually require eight or nine hours. Very nervous or anaemic persons or those subjected to great mental strain from worry or intellectual effort require more than those doing heavy muscular work. They usually take much less. This is radically wrong, for the sleep period is peculiarly the time for neural relaxation and renewal of energy.

Sleep with windows open winter and summer. Comparatively more oxygen must be taken in and stored during the sleeping than during the waking period.

Sleep on the right side for the most part, as this secures the best position of the thoracic and abdominal viscera. Train

yourself, if possible, to breathe through the nose, and prevent diseases of the nose and throat. A hair or felt mattress with small to medium sized pillows and platform spring makes the best bed.

"A tired feeling upon waking is an indication of too little sleep, of disease or of laziness." Get up immediately upon waking. You will sleep more soundly for it the following night, and learn as well to employ fewer hours in sleep and employ them better.

To induce sleep when nervously tired, use one or more of the following simple remedies: Take a warm bath just before retiring; take breathing exercises for five or ten minutes; exercise lightly the muscles of the whole body with open windows; take a short run or a long walk, followed by a light hand bath, or rub down with a coarse towel, or take a good massage.

Drink freely of pure water between meals.

Drink Take a glass or more of cool water upon rising and retiring. Copious water drinking acts as an internal bath and solvent. Do not drink more than one or two glasses at a meal. It is better to drink a glass before the meal and the rest after it. Washing down the food by constant sipping of water is harmful. Do not drink freely of water just before exercise. During athletic and gymnastic contests rinse out the mouth frequently with cool water. It is no harm to take a swallow or two, especially of oatmeal water or acid lemonade. Do not drink ice-cold water at any time.

Milk is an all-round food as well as drink. Buttermilk is most easily digested and is a very wholesome summer drink. The taste for it can often be acquired if it is not at first found palatable.

Coffee and tea are stimulants. They should be discarded. When used in excess they are as *harmful as alcoholic and malt liquors*. "The place of cocoa in the diet is really not very different from that of tea and coffee."—(Hutchinson). The action of cocoa on the nervous system is less—as it contains less alkalis. It has some slight nutritive value owing to the presence of the cocoa fat, but is a source of irritation and sour stomach to many, owing to the difficulty in the digestion of this fat.

Nutrition lies at the very basis of existence.

Nutrition It determines largely not only the strength of muscular effort, but the *character of our thinking*. Too much attention, therefore, cannot be given to the proper selection and preparation of food. It is important not only to determine what to eat and how it should be prepared, its nutritive value and digestibility, but also to regulate the quantity, manner of eating and adaptation to the taste of the individual. The former can readily be determined from dietaries; the latter requires much care and personal attention.

Some of the commonest faults are *insufficient mastication, over-eating*, eating highly seasoned rich mixtures, foods lacking in nutritive value and those which persistently disagree with the stomach. Less common are eating too little, and eating of unpalatable stuff "for conscience's sake" and in obedience to some false scheme of dieting.

Let simplicity, digestibility and palatability determine your diet. Eat regularly, slowly, of plain foods, using plenty of grain and fruits. Use variety in different meals; avoid unwholesome mixtures at the same meal. Stimulants are unnatural and unnecessary. *Never force yourself to eat*. Eat very little when excited or very tired. No dietary will fit all cases; food must be adapted to the normal appetite of the individual.

If *under training* avoid the more fibrous woody vegetables such as cabbage, turnips, etc.; fat meats in general, especially pork because of the difficulty in digestion and the excessive heat production; pies, cakes, rich puddings, and confections because of the danger of undue fermentation from these rich mixtures; a few fruits difficult of digestion; and in general all rich foods, pancakes and other fried foods for the same reasons you avoid fat meat and pastry; avoid also pickles, sauces and condiments, tea, coffee and cocoa, alcoholic and malt liquors. At best they are all dead beats in the digestive economy and do not pay their way, but the stimulants are absolutely pernicious. A true athlete requires no stimulus but the euphoria which springs from reserve force.

From the great variety of wholesome foods remaining, select that which pleases the palate. Use plenty of fruit, grain, toast (Zwieback) and lean meat. Vegetables, grains and all other starchy foods should be most thoroughly cooked. Lean meat and eggs should be eaten rare.

The most wholesome drinks are water, buttermilk, oat-meal water and lemonade. The professed object of dieting for training is to render the alimentary track clean, sweet, free from the slightest local irritation and heat. You want all your strength and a clear head for the athletic event before you. Study adaptation.

Care of Teeth

The importance of *sound and serviceable teeth* as an aid to health cannot be *overestimated*, for upon their good condition depends the thorough mastication of the food, a first requisite for good digestion. Many people dose themselves with all sorts of remedies to aid digestion, when the real cause of their dyspepsia can be directly traced to the poor state of their teeth and the imperfect mastication of food.

The proper time to brush the teeth is after *each meal* and at *bedtime*. Before this is done, all particles of food should be removed from between the teeth by means of dental floss. Then they should be brushed thoroughly with a brush of *medium stiffness*, dipped in tepid water. Very hot and very cold water are equally harmful. A good dentifrice used once a day, followed by rinsing the mouth with some pleasantly flavored antiseptic solution, will help to avert decay of the teeth.

The best method of using the brush is to roll the brush in a direction from the gums towards the cutting edge.

Tartar tends to accumulate on the backs of the teeth, and is very harmful, causing loosening of the teeth and gum boils.

A regular semi-annual visit to the dentist is absolutely essential.

The care of the teeth is a detail of personal cleanliness. To neglect such care is as inexcusable as it is to go with uncut and dirty finger-nails.

Eyesight

Nowhere is the comparison between an ounce of prevention and a pound of cure more applicable than to the care of a student's eyes, for the neglect of seemingly trivial affections, perfectly curable in their beginnings, may lead in a very short time to permanent impairment of vision or even total blindness. When washing, bathe the eyes with clean, cool water.

In reading, the book should be held so that the surface of the page forms a right angle with a line drawn from it to the

eye. The book should not be held nearer than 12 to 15 inches, as it causes too much muscular work. *Never let direct light strike the eye when reading.* The light should always be reflected from the work. Use a *lamp or eye shade.* The best artificial light for the eye is the oil lamp, provided it is strong enough so you do not have to hold the head too near the light. *The light should be steady.* Light should best come from behind the body or over the left shoulder. The incandescent lamp gives fully as much light and is less injurious to the eyesight if the globe is frosted. Rest the eye once in a while by looking at some distant object.

All vision requires energy. Headache often comes from eye strain. *Never read lying down,* as this *interferes with focusing* the eyes and causes eye strain.

Caution. The glasses *must* be fitted by a skilled oculist, after a careful examination of the eyes, for badly fitted glasses will only make matters worse, and by leading the patient to think that the eyes are not in fault, cut off all hope of a cure by a competent oculist.

Diet Table

(The foods in this diet table marked (I) are fattening; those marked (L) laxative; and those marked (G) are to be avoided in cases of rheumatism (rheumatic diathesis.)

Easy to Digest

G I	Beef, roasted fat	L I	Bread, whole wheat
G	Beef, roasted lean	G	Chicken
G I	Beef, broiled fat	I	Cheese. Neuchatel
G	Beef, broiled lean	L	Cooked fruits
	Beef tea	L	Cooked fruits without sugar
L	Baked apple	I	Custard
I	Bread, wheat	I	Eggs, soft-boiled
I	Bread, rye	I	Eggs and milk pudding
L I	Bread, graham		Flounders
L I	Buttermilk	I	Farinaceous pudding
I	Bread, barley		

G	Grouse	L	Pears
	Gelatine		Peas
G	Hare	G	Rabbit
G I	Haddock, with sauce	I	Rice
G	Haddock, without sauce	L	Spinach
G I	Lamb, fat	G	Sweetbreads
G	Lamb, lean	I	Sago
I	Milk	G	Shad
G L I	Mutton, fat	G	Sole
G L	Mutton, lean	G	Smelt
G L	Mutton broth	L	Tomatoes
I	Marmalade	G	Trout
I	Macaroni	G	Tripe
I	Oysters, raw	G	Turbot
I	Oysters, roasted	I	Tapioca
G	Pigeon		Toast
G	Partridge	I	Vermicelli
G	Pheasant	L	Whey

Moderately Digestible

	Asparagus		Lobster
L I	Apples		Mussels
G L I	Bacon	G L I	Oatmeal
	Beets	I	Oyster stew
L I	Barley, boiled		Oysters, broiled
	Clams, roasted	I	Oyster plant
	Cauliflower	I	Onions
	Crabs	L	Oranges
	Cod, fresh	L I	Peaches
I	Cocoa	L	Pineapple
L I	Cherries	L I	Prunes
I	Cream	I	Parsnips
I	Carrots	I	Potatoes, white
	Duck	I	Potatoes, sweet
	Eggs, hard-boiled	L I	Raspberries
L	Grapes	L	Strawberries
	Halibut		Shrimps
	Herring		Snipe
G	Hashes	I	Soups, cream
G	Liver		Soups, plain

I Squash	Turnip
Tea	L I Wheat, cracked
I Stewed meats	Wild water fowl
Turkey	Woodcock
Turtle	G L Veal

Hard to Digest

I Bread, fresh	Mackerel
I Buckwheat cakes	I Muffins, hot
I Butter	Mushrooms
G I Baked beans	Nuts
Cabbage	I Oil
I Cakes, hot	I Oysters, fried
Cheese	G I Pork
L I Currants	I Pastry
I Chocolate	L Plums
L I Corn, green	Pickle
L I Dates	I Pudding, hot batter
L I Dandelion	L Rhubarb
L I Figs	G Salmon
Fried potatoes	Salt meat
I Goose	Sausage
Lobster, fried	Salt fish

The purpose of this classification of foods according to digestibility is to serve only as a general guide.

Nutrition is such a personal matter that conditions and requirements vary with each individual. The ease or difficulty with which a food is digested is so much a personal matter and depends to such an extent on the thoroughness of the preparation, that each individual must by experiment find the foods best adapted for his personal use.

All writers on physiology and hygiene agree that thorough mastication of starchy foods is absolutely necessary, *but neglect to add that certain unsuited combinations in the mouth prevent the primary digestion accomplished by this thorough mastication.* Severe acids neutralize the alkaline secretions of the mouth. Starches are digested in an alkaline medium. A mouthful of bread and butter thoroughly masticated is an excellent food; but if the food is taken with a mouthful of strawberries or orange juice, the alkaline secretion is at once broken down

by the acid, and the primary digestion of the starch is lost. Masticate and swallow starchy foods. Sub-acid fruits are more wholesome than those containing severe acids. Severe acids frequently overpower the mild acids of the stomach and interfere with the digestion of albuminous foods, as milk, eggs, etc. In the presence of moisture, acids and alkalies tear each other apart, forming neutral salts; the salts formed may not interfere with the action of the digestive ferments, but the process of their production taxes digestion.

Do not use an excess of table salt on all foods. Most people think the more salt they use the better the digestion. This is a mistake. A large amount of salt is unnecessary, as meats and cereals contain nearly all the sodium necessary for their digestion.

Vinegar and spices are preservatives. They prevent decay of materials outside of the stomach, and render foods doubly difficult of digestion in the stomach.

Several forms of nitrogenous foods at the same meal are injurious, because they overtax the stomach. What is true of several forms of nitrogenous food is true of several forms of starchy foods. For example, rice and potatoes should not be eaten at the same meal. Starch and sugar are required for heat and energy, but they should be taken in proper proportions and with suitable combinations.

Water, one of the most healthful foods, is injurious when it is taken in large quantities ice cold. Avoid drinking water, coffee or tea while eating; drink at the close of the meal.

A well balanced meal, properly prepared, is satisfying. Meals composed of foods not well combined are not satisfying, in consequence of which the appetite requires at shorter intervals a larger quantity of food than is absolutely necessary for health and vigor.

Prescription *

Some difficulties are so common as to make desirable a brief statement of their general line of treatment. Exercise alone will not correct them, but exercise, diet, baths, change of occupation, and rest, will meet the majority of them.

1. Drink freely of cool water, or hot if troubled with indigestion.

To Increase the Weight

2. Eat the most digestible and fattening foods such as milk, eggs, dates and figs. Take the eggs rare, or raw beaten with milk. Use *Zwei-back* to encourage good mastication. Use also plenty of moist foods well cooked, including the starchy foods, the breakfast grains, potatoes, green corn, etc. Use plenty of fruits and sugar. Avoid such foods as prove constipating. Avoid rich mixtures likely to induce indigestion. Avoid condiments, relishes, stimulants and an excess of acid. Foods marked No. 1 in the diet table are preferable.

3. Let baths be brief and not too frequent. Use a dry rub occasionally as a substitute.

4. Take an occasional massage if practicable. If the skin has become too dry from excessive bathing or any other cause take a good oil rub with the massage.

5. Relax. Give yourself some leisure for recreation. Don't worry. Be regular in your habits.

6. Be scrupulous about the *rest periods* after each meal. *Sleep* from eight to ten hours.

7. Take plenty of slow, regular, light exercise. Practice breathing exercises. Avoid the more exciting strenuous sports. Golf, cricket or light tennis are the type demanded.

In extreme cases of mal-nutrition change to an out-door occupation may be necessary.

1. Reduce the water supply to the minimum, necessary for health. Reduce gradually.

To Reduce the Weight

2. Reduce the amount of food to the minimum. Avoid fattening foods, including the starches, sugars, and sweet fruits. Use acid fruits and *keep the bowels open*. Avoid condiments, relishes, stimulants, and all

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rich mixtures. Use dry foods and masticate well. In extreme cases the diet may need to be made up almost entirely of proteids. Consult the director or your physician.

3. Bathe frequently. Take cold baths after exercise daily. Take a Turkish, electric light or Russian bath once a week, followed by a general massage.

4. Become as active as possible in your general habits of life. Walk two miles or more a day if possible.

5. Take the minimum of sleep which your age and individual needs require. Avoid sluggishness.

6. Begin with light exercise and increase in amount and vigor day by day. The type of exercise required is jog running, vigorous bag punching and abdominal work on the mats. Use heavy weights. Dress warmly in woolen and get up a good sweat. Running, horseback riding, and tennis are good out-of-door exercises.

Drink freely of water. Take a glass or
Constipation more upon rising in the morning and upon retiring. *Eat plenty* of grains, juicy fruits, figs, prunes and other laxative foods. Use bulky foods and moist foods. Masticate thoroughly. *Avoid* fried foods, especially meat and eggs overdone. Avoid pastry and in general the use of much sugar. Foods marked L in the diet table are laxative

Have a regular hour of evacuation.

An occasional *massage of abdomen* is valuable in extreme cases. As soon as possible discontinue massage. Do not become dependent upon it.

Relax. Recreate. Do not worry. Take plenty of rest.

Exercise regularly. Emphasize abdominal work outlined under "abdomen and lower back." In the mat work crowd the knees up into the abdomen. Emphasize breathing exercises, rapid walking, riding horseback, running. In extreme cases, it may become necessary to change from a sedentary to an out-of-door, active occupation.

Exercise *

"The human body is what we make it. Muscle and nerve cells reflect the whole previous hygienic history of man. Nutrition, strength of tissue and organic function are the joint product of diet, exercise and other personal habits of life. Modern conditions of living and of labor are responsible for a deplorable lack of organic vigor, especially among the people of our cities. This tendency to physical degeneration is due principally to lack of muscular exercise involved in sedentary employments. The man who works at a bench or sits in an office must pay the price sooner or later, by the abridgment of his power day by day, by being cut off before his time, or in the degree of health and longevity of his children, unless some means is found to counteract the physical deterioration which logically results from his occupation.

The commonest results of lack of muscular exercise are *stooping posture, flat chest, protruding abdomen, weak, flabby muscles*, "inefficient heart action indicated by shortness of breath and lack of endurance, perhaps indigestion and constipation, headaches, lassitude and disinclination to exertion,—in short general lack of organic vigor.

The best remedy for these conditions is to revert to man's normal mode of living out of doors. Since out-door occupations are few and this manner of life is impracticable for most men, exercises in the gymnasium have been devised to meet as far as possible the need. Regular systematic physical training will do much to counteract the evils which spring from the intense mental application and close confinement involved in the civilization of to-day.

Do not think the results of a half hour or an hour of physical exercise are of indifferent value. It is not true. One-tenth of a day's work will keep one in good physical condition. Fifteen minutes daily of vigorous work will often suffice, if breathing exercises and running (a half-mile or a mile) are included.

Do not think that after a hard day's mental work you are too

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tired to do physical work. Change of occupation is in itself a rest, but when the change is in the nature of a recreation you will find yourself surprisingly rested and reinvigorated through and through. Emphasize games and all out-of-door life. If necessary, be a crank about some game or games which are approved as good for you by the physical director.

Exercise regularly, vigorously, with enthusiasm. Have a definite time for it. Give it all your energy. Enjoy it to the full.

Work *out of doors* as much as possible. Get a good healthy tan. Sunshine is a great tonic. It gives life to people as well as plants.

The best time to exercise is from three to six in the afternoon. Ten to twelve in the morning, seven to nine in the evening are also good. It is better not to exercise too vigorously before breakfast nor within a half hour of bedtime. Sleep is better when the circulation is normal.

The *minimum of exercise* per week which will keep an average man in good health is *three or four hours*. Double the amount of time will secure better *health* and *stronger development*. It is better to divide the time among at least three days.

All-Round Exercise *Take all-round exercise.* There is no one exercise which alone will insure health. Too much specialization upon one group of muscles often develops abnormality. It is rarely conducive to health. *Variety* adds to one's interest. *Class work* will provide this variety and all-round character. Do not practice exclusively one type of physical training, but use *educational, corrective* and *recreative* work in the proportions advised by the physical director.

Exercise must be adapted to the individual. For those deficient in development or in incorrect posture, special corrective work, hygienic gymnastics and lighter games; for the healthy and vigorous, the more vigorous gymnastics, games and athletics; for the average person, light exercise, corrective, hygienic and recreative.

If it is found upon examination that you require any special prescription outside of regular class work, you will note it under "prescription." Few men require special work. If any is assigned, practice it carefully.

The *character* of the exercise selected **Exercise** depends upon your purpose. Exercise for health. Strength will follow and a measure of ease of movement. Use light weights and quick movements chiefly. They make active, elastic muscles. Heavy work gives strength, but slower co-ordination. Strength, endurance and skill are best attained by the mingling of a small amount of vigorous effort with a large amount of light work, by preserving the right proportions between corrective, educational and recreative forms of exercise.

Avoid working for mere size of muscles. **Size of Muscles** You will be disappointed. There is often a rapid increase in size for a few weeks. Later development in size is slower, but the more important work of increase in muscular function, neural control and organic vigor is still going on. *Measure* your improvement by *what you can do*, not by *size*.

Need of Exercise *Avoid* making work out of your play. Don't worry. *Relax* and have a *good time*. *Avoid* exhausting feats of strength. Take no vigorous exercise within *two hours* after a full meal. Never exercise until *exhausted*. **As long as you are able to be about, you will profit by exercise.** Adapt it to your need as you do food.

Begin lightly, warm up to vigorous exercise and finish quietly. Practice corrective exercise first, before you are tired from other work. When practicing alone, spend the first part of your time in following out your special prescription of exercise.

The following order of exercise is recommended by Dr. Meylan of Columbia University.

1. *A General Exercise*—not too violent, to set the blood moving more rapidly, such as passing the medicine balls, a jog around the track, or a free-hand movement.

2. *Arm Movements*—Either with or without apparatus or with quarter circle, or overhead pulleys, accompanied by slow, deep breathing.

3. *Hanging Exercises*—Fixing the chest wall and raising the body. Examples: Horizontal ladders, high bars, horizontal bars, rings, climbing rope, climbing ladder and stall bars.

4. *Balance Movements*—Any exercise where the base is reduced. Examples: Standing on one foot, raising on the toes or heels, hopping with right or left leg, or walking on one bar of the low parallels.

5. *Shoulder-blade Work*. Chest weights and Indian clubs; arm swings and thrusts, with or without bells.

6. *Abdominal Exercises*—Lying on the back, raise one or both legs. Sitting on benches or floor with feet fixed, bend backward from hips, keeping back straight and head erect. Hanging position, raise legs, with knees bent or straight, alternately or together. The same when standing are also good, especially when done in quick rhythm.

7. *Lateral Trunk*—Any movements including sidebendings, side pulley-weight work, and straight leg vaulting to left or right.

8. *Slow Leg Exercises*—High and low leg pulleys, head and shoulder lift, and knee bending with or without dumb-bells in the hands.

9. *Jumping, vaulting, tumbling, running, wrestling, boxing, racing, games, etc.*

10. *A few slow, deep respirations.*

11. *A bath—a dash of warm water followed by cold.*

12. *Rub down* briskly and dress slowly.

By following this order of exercise and working *continuously* and *vigorously*, you will get the *best results* for the time expended.

Exercises for Developing the Various Parts of the Body

The first requisite for good health is organic **Organic Vigor** vigor. The vital thing in securing *organic vigor is nutrition*. Poor heredity, occupation and disease may make the acquirement of organic vigor exceedingly difficult and slow. Employ the general directions under "How to increase weight." But those who are nervous or have suffered from general debility should decrease the amount of exercise and increase the rest periods. Lay special stress upon

exercises for broadening and deepening the trunk, and improve the differential capacity. Develop the respiratory muscles and increase the organic capacity of the trunk. This may be accomplished by muscular work and by breathing exercises.

The heart, being a muscular organ, may be strengthened by certain exercises. If the heart is organically sound but weak in its action, or abnormally rapid, gymnastics tend to strengthen its action and reduce the rate to the normal. If the extremities are habitually cold, strengthen the action of the heart and increase the lung capacity. Exercises given for widening and deepening the chest are helpful in treating the heart. If the posture, occupation or dress cramps the chest, it will affect the action of the heart unfavorably. Before attempting to exercise the heart, remove any cause of interference with its working. Breathing exercises aid the heart's action, especially when air is taken in through the nose. If when playing games or taking exercise you become "out of breath" or get "winded" before the others taking the same kind of exercise, report to the Director. Do not put too much emphasis upon muscular size and symmetry, but on what you can *do*.

The cuts on pages marked "Vital" and "Special," show parts developed by exercises as prescribed.

Exercises for Trunk Development Cut "Vital," Page 30. No. 3. *Trunk length* is practically a fixed quantity except during the growth period. Under twenty years of age it may be modified considerably by the practice of suspended exercises, as climbing ropes, ladders, poles, etc., and by attention to posture.

Length of chest cavity may be increased considerably by the use of abdominal breathing.

Chest breadth. Cut "Vital," Page 30. Nos. 4, 5, 9 and 10. Arm raising sideward and upward, with dumb-bells or overhead pulleys. Bend arms and then thrust them up. With back resting against the backboard at the chest weight and with the ropes through lower pulleys, raise arms sideways and upwards overhead. Hang and travel with hands wide apart, on rings and other overhead apparatus.

Breathing exercises, distending the lower chest laterally by *arm elevation sideways*, inhaling as the arms are elevated, exhal-

ing as the arms are lowered to side. *Travelling parallel bars.*
Swimming or swimming motions.

Chest depth. Cut "Vital," Page 30. Nos. 7 and 8. To correct flat chest. Arm elevation forward. Inhale when arms are raised. Exhale when they are lowered. Arm raising with dumb bells, clubs, wands, or overhead pulleys forward. Voluntary chest arching, chest weights. Quarter circle. *Running and climbing.*

Waist breadth. Cut "Vital," Page 30. No. 6. Standing position, sideward bend and sideward twist. Flank vault. Chest weights, dumbbells. Hang and travel with hands wide apart on rings and other overhead apparatus. Leg elevation sideways.

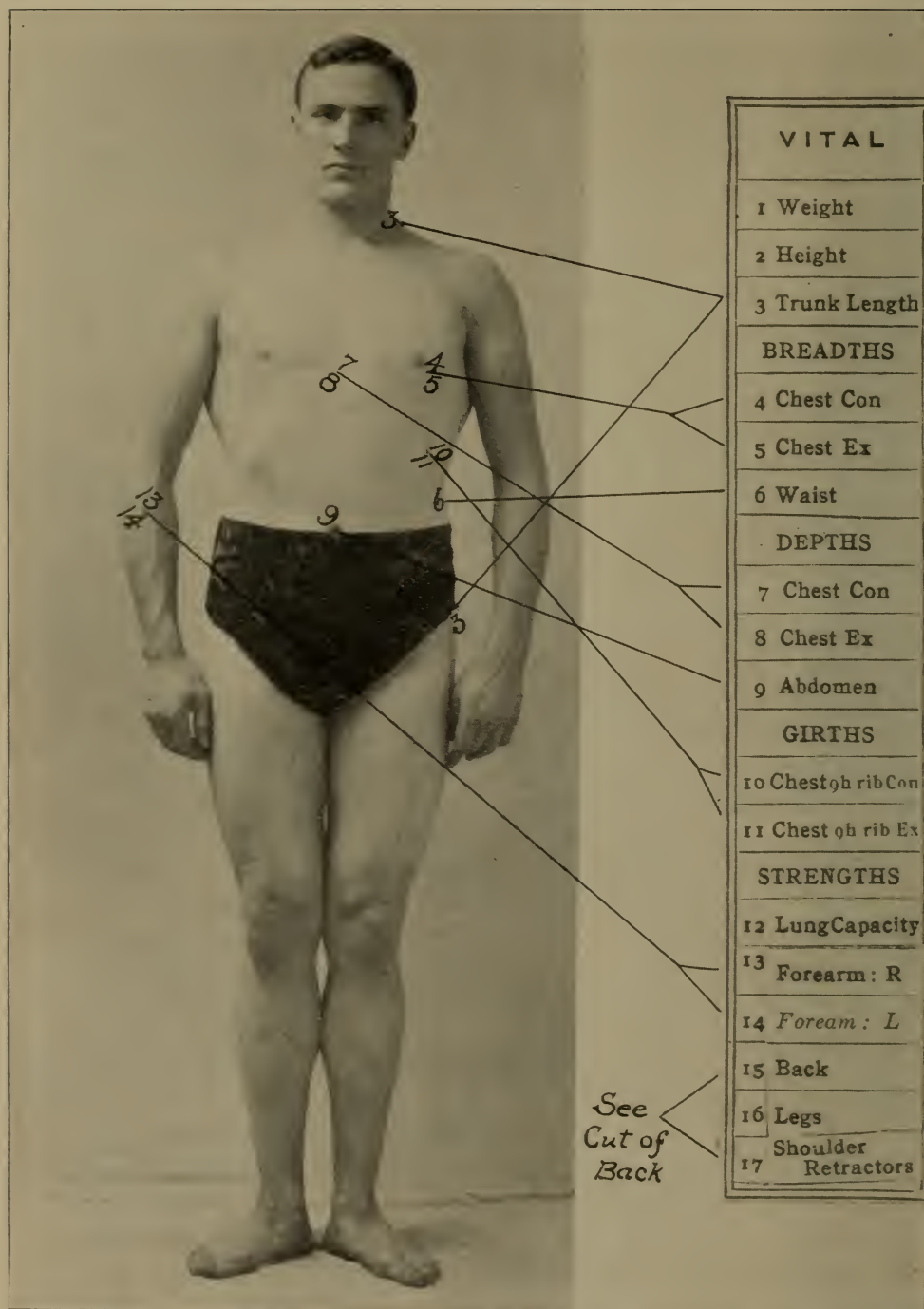
Abdomen. Cut "Vital," Page 30. No. 9. Standing position, trunk forward and backward bend. Knee elevation and stretching forward. Lying on back, leg elevation upward, legs bent or straight. Lying on back, rise to sitting position with arms at sides, folded on chest or neck firm position. Abdominal table. *Running, hurdling or jumping.*

Back. Cut "Special," Page 31. No. 15. Trunk flexion forward and backward, with hands on hips, on neck, or with arms overhead. Pulley weights; facing machine. Pull up to chin, hang with hands wide apart. Body horizontal on toes and hands, dip touching chest to floor. Prone lying position on bench, downward bend. Floor pulleys, forward bending and raising trunk. *Rowing and bowling.*

Cut "Special," Page 31. No. 1. *For low*
Shoulders *shoulder.* Shrug low shoulder with or without iron dumbbell in hand. Push up iron dumbbell from low shoulder, body bent slightly forward from the hips. *Any exercise carrying the arm from the body against resistance.*

Shoulder circling. Arm raising with dumbbells. Arm raising with chest weights, sideways, upward, back and front. Backward swings with clubs. *Dipping exercises.* Travelling parallels. *Traveling rings.*

Cut "Special," Page 31. No. 2. *Any exercise moving the head against resistance.* Head flexion bending forward, backward, towards left and right shoulder alternately. Head torsion to left or right. *Head circling.* Bend head backward, forward and to each side, resisting with hands. Neck machine. *Head springs, rolls and snaps.*



VITAL

1 Weight

2 Height

3 Trunk Length

BREADTHS

4 Chest Con

5 Chest Ex

6 Waist

DEPTHS

7 Chest Con

8 Chest Ex

9 Abdomen

GIRTHS

10 Chest 9h rib Con

11 Chest 9h rib Ex

STRENGTHS

12 Lung Capacity

13 Forearm : R

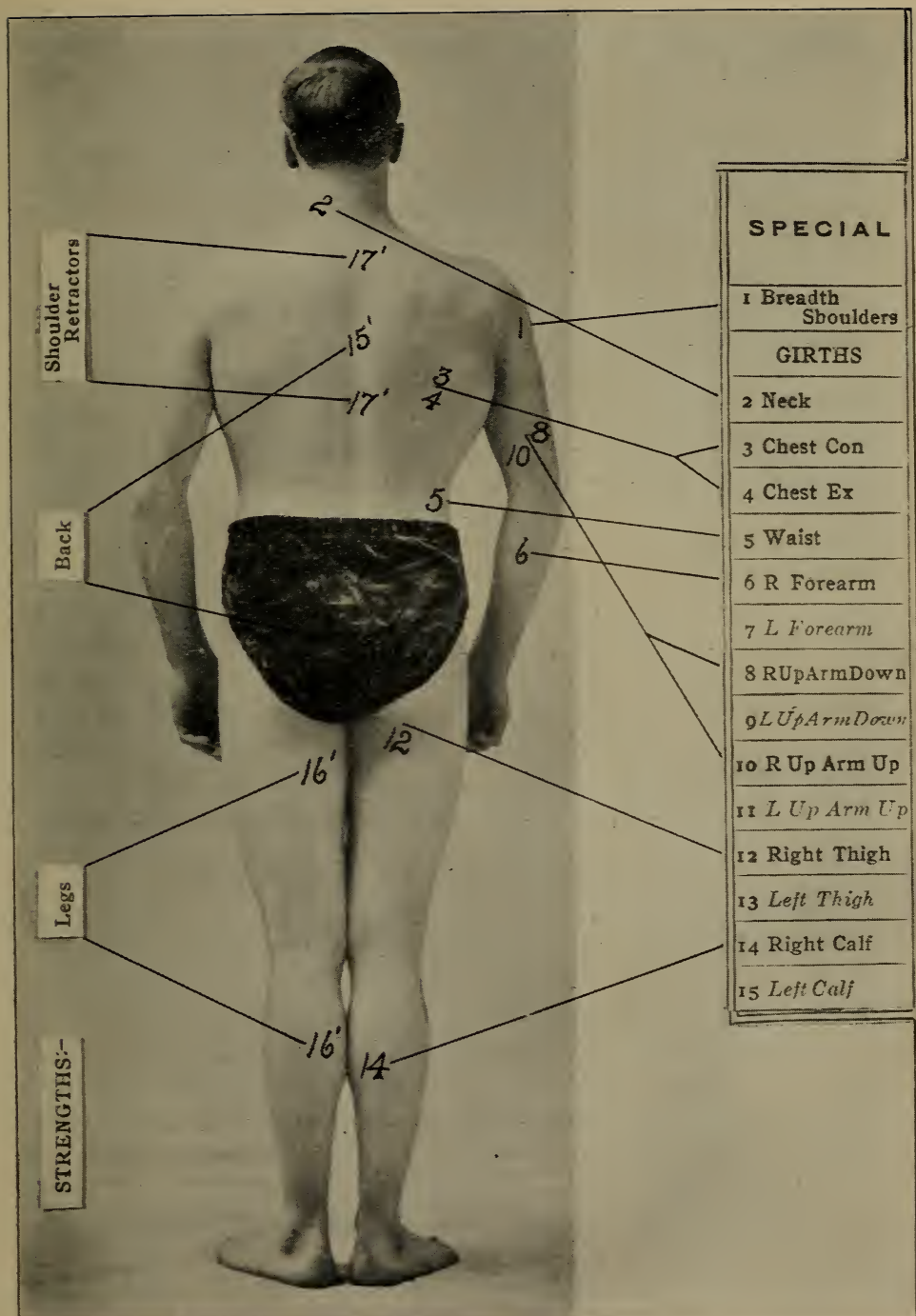
14 Forearm : L

15 Back

16 Legs

17 Shoulder Retractors

See
Cut of
Back



Cut "Special," Page 31. Nos. 6, 7. Cut **Forearm and Wrist** "Vital." 31. Nos. 13 and 14. *Any exercise flexing and extending fingers and wrists, or pronating or supinating the forearm against resistance.* Finger flexion and extension, wrist flexion and extension. Wrist twists with dumbbells, small circles with clubs. Rings, horizontal bar, ladders, suspended parallels or ladders. Wrist machine. *Rope climbing.*

Cut "Special," Page 31. Nos. 8, 9. **Back Upper Arm (Triceps).** *Any exercise of the arm locking the elbow against resistance.* Extension of the arm with chest weights. With back to machine, extend the forearm, moving upper arm as little as possible. Downward thrusts with dumb-bells. Push up iron bells. *Dips on floor or parallels.* Inclined chest bars. *Hand walking.*

Cut "Special," Page 31. Nos. 8, 10. **Front Upper Arm (Biceps).** *Any exercise flexing the forearm upon the arm.* Arm flexion and triceps resisting. Arm flexion with dumbbells. Chest weights. Face weights and flex the arms. "Chining" to a bar. *Ladder and rope climbing.*

The Deltoid *Any movement where the straight arm is swung to the height of the shoulder.* Swing the iron bells front and out. Chest weight. Stand with left side to the chest weight, right arm curved back of the body. Straighten arm, and swing shoulder high to the right.

Cut "Special," Page 31. Nos. 12, 13. **Thigh or Upper Leg** *Front of the thigh. Any exercise flexing the thigh or bending the leg.* Deep knee bending with or without weights. Jumping, running, hurdling, hopping. Sliding seat on rowing machine.

Back of Thigh. *Any exercise extending the thigh or bending the knee.* Thigh extension, knees straight and toes pointed. Running. Low forward trunk bending, touching floor with fingers, knees straight.

Outside. Any exercise spreading the legs, on horse, parallels or in free calisthenic work. Abduct thigh in standing, sitting, hanging position or with leg machine.

Inside. Abduct thigh. Same leg-spreading movements as for abduction, with emphasis of the exercise upon leg-closing instead of upon parting. Open and close feet. *Running and hill climbing.*

Cut "Special," Page 31. Nos. 14, 15.

Lower Leg *Front.* Raise toes, keeping trunk and hips well forward, knees straight.
Back calf muscles. Heel raising. Hopping. Jumping.
Walking and running on toes.

Kyphosis

Cut "Special," Page 31. Shoulder retractors. *Special exercises for round and stooping shoulders.*

1. Assume the best possible standing position, with head erect, chest arched, hips back. "*When standing holding the neck against the back of the collar will tend to elevate the chest and correct position of the spine.*"

2. *Arm elevation forward.* The fully extended arms are quickly raised forward and upward over the head. Then the arms are lowered slowly sideways. Keep the chest well forward, head and trunk still. Inhale as arms are raised; exhale when they are lowered.

3. *Arm elevation sideways.* The stretched arms are moved slowly sideways and upward till they attain a vertical position above the head. Slowly lower arms to side. Inhale when arms are raised; exhale when they are lowered.

4. *Arm rotation.* Take position with arms bent at right angles, upper arms shoulder high. Rotate or twist both arms in the shoulder joints so as to bring the forearms horizontally forward, parallel with the floor and with each other. Rotate to first position and repeat 6 to 12 times.

5. *Arm fling, sideways.* Raise the upper arms horizontally sideways and keep well back, with the forearms sharply bent upon them in front. From this position the forearms are energetically thrust outward. Bend the forearms quickly forward and repeat.

6. Bend the arms so as to bring the hands above the shoulders and close to the neck; keep the upper arms horizontal. Keeping arms at same angle, force them to the front, so the elbows will be on a line with the chin; force the elbows to the rear as far as possible.

7. *Neck work.* Lie face downward, on the floor or mat, resting forehead on the folded arms. Raise head as high as possible.

8. *Upper spine.* With neck firm, position lying face down, feet fixed, raise the shoulders as high as possible.
9. Swimming motion.
10. Pull up to chin, hanging position, hands wide apart.
11. Prone position on bench, feet fixed, arm movements.
12. Sleep without a pillow or at least a very flat one.
13. Arm bending and arm parting at chest weights, *facing weights.*

Medical Advice for Students

For the benefit of the members of the College who are without a family physician in Lewiston or Auburn, the officers of the College have presented the list of consulting physicians, oculists and dentists printed in this Manual. A more complete list of reliable specialists in Medicine, Surgery and Dentistry is kept in the Director's office for the convenience of students. The remuneration for professional services must be arranged between the student and the physician consulted.

The Director of Physical Training may be consulted on matters of physical exercise and personal hygiene.

Explanation of Anthropometric Table

The table shows how you compare with about 5000 men.

There are twenty-three columns, headed with bold figures indicating per cents. In each column such a percentage of the whole number of men had the development indicated or less.

If you are of *medium height* and *well developed in every particular*, the line across the table, which joins the dot showing development of individual qualities, will follow closely the black figures of the 50 per cent. column. The better your measurements are, the more nearly straight will be this line which represents them. If you are tall or short, this table shows simply how you compare in each quality with a general average of all the different types.

Inter-Collegiate Strength Test

(1)	Weight	_____	_____	_____
(2)	Strength of Biceps (pull up)	_____	_____	_____
(3)	" " Triceps (push up)	_____	_____	_____
(4)	" " Lungs	_____	_____	_____
(5)	" " Back	_____	_____	_____
(6)	" " Legs	_____	_____	_____
(7)	" " Right Fore-arm	_____	_____	_____
(8)	" " Left Fore-arm	_____	_____	_____
(9)	" " Chest and Upper Arms .	_____	_____	_____
(10)		_____	_____	_____
	Total	_____	_____	_____

VITAL PER CENT.	190....		1	2	5	10	15	20	25	30	35
	Mo	Da	HR								
Weight	45 0	47 0	50 2	53 0	55 0	56 5	57 8	58 9	60 0		
	98 9	103 5	110 5	116 7	120 9	124 2	127 1	129 6	132 0		
Height	161 0	162 3	164 1	166 1	166 9	167 9	168 6	169 4	169 9		
	63 4	63 9	64 6	65 4	65 7	66 1	66 4	66 7	66 9		
Trunk Length	61	62	63 2	64 3	65 0	65 5	66 0	66 5	67 0		
	24 0	24 4	24 9	25 3	25 6	25 8	26 0	26 2	26 4		
Bd. Chest Con.	21 3	21 8	22 3	23 6	24 1	24 6	24 8	25 1	25 4		
	8 4	8 6	9 0	9 3	9 5	9 7	9 8	9 9	10 0		
Bd. Chest Exp.	23 4	24 1	24 8	25 7	26 4	26 9	27 2	27 7	27 9		
	9 2	9 5	9 8	10 1	10 4	10 6	10 7	10 9	11 0		
Bd. Waist	21 6	22 1	22 6	23 4	23 6	24 1	24 4	24 6	24 8		
	8 5	8 7	8 9	9 2	9 3	9 5	9 6	9 7	9 8		
Dp. Chest Con.	15 9	16 1	16 5	16 9	17 1	17 3	17 4	17 5	17 7		
	6 3	6 4	6 5	6 7	6 8	6 8	6 9	6 9	7 0		
Dp. Chest Exp.	16 4	16 8	17 5	18 1	18 5	18 9	19 2	19 4	19 7		
	6 5	6 6	6 9	7 1	7 3	7 4	7 6	7 7	7 7		
Dp. Abdomen	14 9	15 2	15 9	16 4	16 6	16 9	17 1	17 3	17 5		
	5 9	6 0	6 3	6 4	6 6	6 7	6 8	6 8	6 9		
Girth Chest 9th R. Con.	68 6	69 7	71 1	72 6	73 6	74 3	75 0	75 5	76 0		
	27 1	27 5	28 1	28 6	29 0	29 3	29 5	29 7	29 9		
Girth Chest 9th R. Exp.	70 7	72 2	74 5	76 6	78 0	79 0	80 0	80 9	81 6		
	27 8	28 4	29 3	30 2	30 7	31 1	31 5	31 8	32 1		
STRENGTHS											
Lung Capacity	2 5	2 7	3 0	3 2	3 4	3 5	3 6	3 7	3 8		
	153 1	164 3	181 4	196 6	206 7	214 9	221 9	222 8	234 0		
Forearm R.	26 1	28 5	32 2	35 4	37 6	39 3	40 8	42 1	43 4		
	57 5	62 7	70 8	77 9	82 7	86 5	89 8	92 7	95 5		
Forearm L.	25 9	28 1	31 6	34 6	36 7	38 4	39 8	41 2	42 2		
	56 9	61 9	69 5	76 2	80 7	84 4	87 5	90 7	92 9		
Back	74 5	83 4	97 4	108 9	116 8	123 2	128 8	133 6	138 3		
	164 0	183 5	214 2	239 5	257 0	271 1	283 3	294 0	304 2		
Legs	102 2	112 3	127 7	141 5	150 5	157 9	164 2	169 8	175 1		
	224 8	247 0	281 0	311 2	331 2	347 4	361 3	373 6	383 3		
Shoulder Retractors	19 5	21 8	25 2	28 2	30 2	31 8	33 2	34 4	35 6		
	43 0	47 9	55 4	62 0	66 5	70 0	73 1	75 8	78 4		
SPECIAL											
Bd. Shoulders	36	36 5	37 6	38 2	38 7	39 1	39 5	39 9	40 2		
	14 2	14 4	14 8	15 1	15 3	15 4	15 5	15 7	15 8		
Girth Neck	31	31 5	32 2	33 0	33 2	33 7	34 0	34 3	34 5		
	12 2	12 4	12 7	13 0	13 1	13 3	13 4	13 5	13 6		
Girth Chest Con.	75 2	76 2	78 2	79 8	80 9	81 8	82 6	83 2	83 8		
	29 6	30 0	30 8	31 4	31 9	32 2	32 5	32 8	33 0		
Girth Chest Exp.	80 0	81 6	83 9	86 0	87 4	88 5	89 4	90 2	91 0		
	31 5	32 1	33 0	33 9	34 4	34 8	35 2	35 5	35 8		
Girth Waist	62 8	64 1	65 3	67 8	69 0	69 9	70 7	71 4	72 1		
	24 7	25 2	25 7	26 7	27 1	27 5	27 8	28 1	28 4		
Girth R. Forearm	22 6	23 1	23 8	24 4	24 8	25 1	25 3	25 6	25 8		
	8 9	9 1	9 4	9 6	9 7	9 9	10 0	10 1	10 2		
Girth L. Forearm	22 6	23 1	23 8	24 4	24 8	25 1	25 3	25 6	25 8		
	8 9	9 1	9 4	9 6	9 7	9 9	10 0	10 1	10 2		
Girth R Up Arm Down	20 9	21 5	22 5	23 4	24 0	24 4	24 8	25 2	25 4		
	8 2	8 5	8 9	9 2	9 4	9 6	9 8	9 9	10 0		
Girth L Up Arm Down	20 7	21 3	22 3	23 2	23 8	24 2	24 6	25 0	25 2		
	8 1	8 4	8 8	9 1	9 3	9 5	9 7	9 8	9 9		
Girth R Up Arm Up	24 5	25 2	26 2	27 1	27 7	28 1	28 6	28 9	29 3		
	9 7	9 9	10 3	10 7	10 9	11 1	11 3	11 4	11 5		
Girth L Up Arm Up	24 3	25 0	26 0	26 9	27 5	27 9	28 4	28 7	29 1		
	9 6	9 8	10 2	10 6	10 8	11 0	11 2	11 3	11 4		
Girth Right Thigh	43 5	44 5	45 9	47 1	48 0	48 7	49 2	49 8	50 3		
	17 1	17 5	18 1	18 6	18 9	19 2	19 4	19 6	19 8		
Girth Left Thigh	43 3	44 3	45 7	46 9	47 8	48 5	49 0	49 6	50 1		
	17 0	17 4	18 0	18 5	18 8	19 1	19 3	19 5	19 7		
Girth Right Calf	29 8	30 4	31 4	32 2	32 7	33 1	33 5	33 9	34 2		
	11 7	12 0	12 3	12 7	12 9	13 1	13 2	13 3	13 5		
Girth Left Calf	29 8	30 4	31 4	32 2	32 7	33 1	33 5	33 9	34 2		
	11 7	12 0	12 3	12 7	12 9	13 1	13 2	13 3	13 5		
Dip	0	0	0	1	2	3	3	4	5		
Pull Up	0	0	1	2	3	4	4	5	6		
COEFFICIENTS											
				R. H. C.			.107				
				O. S. H. C.			174.61				
				V. C.			18.64				
				V. W. C.			.324				

Extract from Manual for Physical Measurements. Hastings

Measurements of Taken.....

RIC TABLE

	50	55	60	65	70	75	80	85	90	95	98	99	+D*	190.... Mo Da Hr
0	63.0 138.6	64.0 139.8	65.0 143.0	66.0 145.2	67.1 147.6	68.2 150.1	69.5 153.3	71.0 156.3	73.0 160.5	75.8 166.7	79.0 173.7	81.0 178.3	11.5	
2	171.7 67.6	172.2 67.8	172.8 68.0	173.5 68.3	174.2 68.6	174.8 68.8	175.5 69.1	176.3 69.4	177.3 69.8	179.3 70.6	181.1 71.3	182.4 71.8	1.22	
5	68.0 26.8	68.5 27.0	68.8 27.1	69.0 27.2	69.5 27.4	70.0 27.6	70.6 27.8	71.1 28.0	71.9 28.3	72.9 28.7	74.2 29.2	75.2 29.6	8	
9	26.1 10.3	26.4 10.4	26.6 10.5	26.9 10.6	27.2 10.7	27.4 10.8	27.7 10.9	28.2 11.1	28.7 11.3	29.4 11.6	30.4 12.0	31.0 12.2	55	
2	28.7 11.3	28.9 11.4	29.2 11.5	29.4 11.6	29.7 11.7	30.2 11.9	30.4 12.0	31.0 12.2	31.7 12.5	32.5 12.8	33.2 13.1	34.0 13.4	6	
3	25.4 10.0	25.5 10.1	25.7 10.1	25.9 10.2	26.1 10.3	26.4 10.4	26.6 10.5	26.9 10.6	27.4 10.8	27.9 11.0	28.7 11.3	29.2 11.5	4	
9	18.0 7.1	18.1 7.2	18.2 7.2	18.4 7.3	18.5 7.3	18.6 7.4	18.7 7.4	18.9 7.5	19.1 7.6	19.5 7.7	19.9 7.9	20.2 8.0	25	
1	20.3 8.0	20.5 8.1	20.7 8.2	21.0 8.3	21.2 8.4	21.4 8.5	21.7 8.6	22.0 8.7	22.5 8.9	23.1 9.1	23.8 9.4	24.2 9.6	45	
8	18.0 7.1	18.2 7.2	18.4 7.2	18.5 7.3	18.7 7.4	18.9 7.5	19.1 7.5	19.4 7.6	19.7 7.8	20.2 8.0	20.7 8.2	21.1 8.3	35	
0	77.5 30.5	78.0 30.7	78.5 30.8	79.0 31.1	79.5 31.3	80.0 31.5	80.7 31.8	81.3 32.0	82.3 32.4	83.7 32.9	85.2 33.6	86.2 34.0	10	
1	83.8 33.0	84.6 33.3	85.3 33.6	86.0 33.9	86.8 34.2	87.6 34.5	88.6 34.9	89.7 35.3	91.1 35.9	93.2 36.7	95.5 37.6	96.9 38.2	1.5	
7														
0	4.1 250.0	4.2 255.3	4.3 260.6	4.4 266.0	4.5 271.9	4.6 278.1	4.7 285.1	4.8 293.3	5.0 303.4	5.2 318.6	5.5 335.7	5.7 346.9	28.1	
7	46.8 103.0	47.9 105.5	49.1 108.0	50.2 110.5	51.5 113.3	52.8 116.2	54.3 119.5	56.0 123.3	58.2 128.1	61.4 135.2	65.1 143.3	67.5 148.5	13.3	
5	45.5 100.0	46.6 102.4	47.8 104.8	48.8 107.1	49.8 109.8	51.2 112.5	52.6 115.6	54.3 119.3	56.4 123.8	59.4 130.5	62.0 138.1	65.1 143.1	12.5	
6	150.9 332.0	155.1 341.3	159.3 350.5	163.5 359.8	168.2 370.0	173 380.7	178.6 392.9	185.0 407.0	192.9 424.5	204.4 450.8	218.4 480.5	227.3 500.0	48.7	
7	189.5 417.0	194.3 427.6	199.1 438.2	203.9 448.7	209.2 460.4	214.8 472.7	221.1 486.6	228.5 502.8	237.5 522.8	251.3 553.0	266.7 587	276.8 609.2	55.7	
8	88.8 1.8	89.8 3.7	90.9 5.1	92.0 6.4	93.2 7.8	94.4 9.0	95.8 10.7	97.7 12.3	100.8 14.3	103.8 16.5	108.8 21.9	115.4 27.8	12.3	
7														
7	40.9 16.1	41.1 16.2	41.4 16.3	41.7 16.4	42.0 16.5	42.3 16.7	42.7 16.8	43.2 17.0	43.7 17.2	44.2 17.4	45.2 17.8	46.2 18.0	55	
0	35.3 13.9	35.5 14.0	35.8 14.1	36.0 14.2	36.3 14.3	36.6 14.4	36.8 14.5	37.3 14.7	37.8 14.9	38.3 15.1	39.0 15.4	39.6 15.6	5	
8	85.6 33.7	86.2 33.9	86.8 34.2	87.3 34.4	88.0 34.6	88.6 34.9	89.4 35.2	90.3 35.6	91.4 36.0	93.0 36.6	94.9 37.4	96.1 37.8	1.2	
5	93.2 36.7	93.9 37.1	94.7 37.3	95.4 37.6	96.2 37.9	97.0 38.2	98.3 38.7	99.3 39.1	100.6 39.7	102.5 40.4	104.8 41.3	106.4 41.9	1.5	
4	74.0 29.1	74.6 29.3	75.1 29.6	75.8 29.8	76.4 30.1	77.2 30.4	78.0 30.7	78.9 31.1	80.0 31.5	82.6 32.5	83.8 33.0	85.1 33.5	1.27	
3	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
2	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
1	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
0	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
3	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
2	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
1	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
0	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
3	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
2	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
1	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
0	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
3	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
2	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
1	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
0	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
3	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
2	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
1	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
0	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
3	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
2	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
1	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
0	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
3	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
2	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
1	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
0	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
3	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
2	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
1	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
0	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
3	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
2	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
1	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
0	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
3	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	29.1 11.5	29.7 11.7	30.2 11.9	43	
2	26.4 10.4	26.6 10.5	26.8 10.6	27.0 10.7	27.2 10.7	27.5 10.8	27.8 10.9	28.1 11.1	28.5 11.2	2				

The 25 per cent. and 75 per cent. columns, as well as the 50 per cent. column, are set off by bold lines to mark the limits of normal deviation from the 50 per cent. line or type. When your development in some particulars is below the 25 per cent. line, it may be necessary for you to take special corrective exercises.

If your vitality co-efficient (V. C.) is very low, you require plenty of out-of-door exercise. Take only such corrective gymnastics and games as the physical director or your family physician may encourage. For men whose height is between the 25 per cent. and 75 per cent. lines, the use of co-efficients may prove valuable.

Co-Efficients

You will note at bottom of Anthropometric Table on next page the term *co-efficients*.

The formula for Respiratory-Height Co-efficient is:

$$\frac{\text{Chest Expansion} \times \text{Lung Capacity}}{\text{Height.}}$$

Chest expansion and height are in centimeters; lung capacity is in litres. This product of *Chest Expansion* and *Lung Capacity* divided by *Height* shows the amount of respiratory strength and function for each centimeter of height.

Breadth of Chest is equivalent to the half sum of Breadth of Chest Contracted and Expanded. Depth of Chest (trunk) is obtained as follows: Take the half sum of Depth of Chest Contracted and Expanded, add the result to Depth of Abdomen, and take the half sums.

The formula for the Organic Strength-Height co-efficient is:

$$\frac{\text{Height sitting} \times \frac{1}{2} (\text{Breadth of Chest plus Breadth of Waist}) \times \text{Depth of Trunk}}{\text{Height.}}$$

This co-efficient is found by taking the product of the Height Sitting (length) by the half sum of Breadth of Chest plus Breadth of Waist (Breadth) by the Depth of Chest (depth) and dividing this product by the Height. This co-efficient represents the relative size and power of the vital organs of the trunk for each centimeter of height. It is approximately the ratio of the solid contents of the trunk to the height.

The Vitality Coefficient (V. C.) is the product of the Respiratory-Height Co-efficient \times Organic Strength-Height Co-efficient.

This co-efficient is obtained by taking the product of the Respiratory-Height Co-efficient by Organic Strength-Height Co-efficient. It is the product of the total exhibition of respiratory strength by the total strength of the vital organs as indicated by their bulk. It is a merging of all the capacity for endurance into one. It is generally conceded that vitality varies in a direct ratio with each one of the physical qualities used in the calculation of these co-efficients, with lung capacity, chest expansion, height sitting, breadth of chest, breadth of waist and depth of chest; then the combination of all these qualities should produce a most satisfactory general index of vital strength and function.

The Vitality Co-efficient calls attention to the fact that vitality is high, medium, or low; the Respiratory-Height Co-efficient indicates whether respiratory function is responsible for the condition; Organic Strength-Height Co-efficient whether trunk capacity is responsible; the graphical representation of development upon the table indicates the particular measurement, or measurements, which are responsible for the character of the co-efficients, and shows where development is needed.

The formula for Vital-Weight Co-efficient is:

$$\frac{V. C.}{Weight.}$$

The Vital-Weight Co-efficient is obtained by dividing the Vitality Co-efficient by the Weight.

It shows the ratio of vital function to body bulk to be sustained; that is, the relation of the purveying organs to the organism. Of two men of the same weight, the man with large trunk and good respiratory power should have the greater vitality.

Co-efficients based on a per centile table for all ages and heights have little value for men of extreme heights. Only height tables for each age can provide co-efficients of value to all types of individuals.

The following quotation is taken from Sargent's "Health, Strength and Power."

"The best type of man for all-round service is one who weighs from 2 to 2.5 pounds to every inch in height, and the

most capable women are those who range in weight from 1.8 to 2.3 pounds to each inch in height. In order to determine your own factor in this particular, divide your weight in pounds by your height in inches."

"The insurance companies allow a variation of twenty per cent. from the normal weight."

"This variation would allow a person whose normal weight was 150 pounds to drop to 120 pounds or raise his weight to 180 pounds, before passing the physiological limit."

Chest Weights

Exercise No. 1. Position: Face weights, arms extended to front horizontal, palms down, body rigid, heels together, head erect. *Movement:* Holding arms and body rigid, bring handles down to thighs. Alternate. Times _____.

Exercise No. 2. Position: As in Exercise 1, palms toward each other. *Movement:* Pull the arms straight back, bending elbows (at sides) till handle nearly touches shoulder. Alternate. Times _____.

Exercise No. 3. Position: As in Exercise 1. Alternate Exercises 1 and 2. Times _____.

Exercise No. 4. Position: Same as in Exercise 1, palms up. *Movement:* Bend arms at elbows (sides), carrying hand over shoulder. Alternate. Times _____.

Exercise No. 5. Position: As in Exercise 1. *Movement:* Bring both hands back to shoulders, bending elbows outward, keeping upper arms parallel to floor. Alternate. Times _____.

Exercise No. 6. Alternate as in Exercises 4 and 5.
Times _____

Exercise No. 7. Position: As in Exercises 1. *Movement:* Raise arms to vertical position over head, palms toward weights. Alternate. Times _____.

Exercise No. 8. Position: As in Exercise 1, palms towards each other, carry arms out to side horizontal position. Times _____.

- Exercise No. 9.* Alternate Exercises 7 and 8. Times _____.
- Exercise No. 10.* Position: As in Exercise 1. *Movement:* Raise right arm vertically over head, as in Exercise 7; lower left arm to thigh, as in Exercise 1. Times _____.
- Exercise No. 11.* Same as in Exercise 10. Right arm over head, vertical position; left lowered to thigh. Times _____.
- Exercise No. 12.* Alternate Exercises 10 and 11. Times _____.
- Exercise No. 13.* Position: As in Exercise 1. Carry right arm over head vertical position, left arm out to side horizontal position. Times _____.
- Exercise No. 14.* Same as Exercise 13. Left arm overhead, vertical position, right out to side horizontal position. Times _____.
- Exercise No. 15.* Alternate Exercises 13 and 14. Time _____.
- Exercise No. 16.* Position: As in Exercise 1, Feet apart. *Movement:* Bend body forward, arms straight, carry hands down, nearly touching floor. Return to original position and raise arms to vertical position over head. Times _____.
- Exercise No. 17.* Position: As in Exercise 1. *Movement:* Hands together, rotate at hips, carrying both arms to horizontal position right side. Times _____.
- Exercise No. 18.* Same as Exercise 14, to left. Times _____.
- Exercise No. 19.* Alternate Exercises 14 and 15. Times _____.
- Exercise No. 20.* Position: As in Exercise 1. *Movement:* Keeping arms and legs stiff and straight, bend body to the right and downward, until the hands nearly touch the floor. Times _____.
- Exercise No. 21.* Same as Exercise 17, bend to the left. Times _____.
- Exercise No. 22.* Position As in Exercise 1. *Movement:* Bring arms down to sides, as in first movement, at the same time bending knees as much as possible. Keep the body erect. Times _____.
- Exercise No. 23.* Position: With back to weights. *Change:* Step about twelve inches nearer weights with left foot; at same time place right handle underneath left handle, into fingers of left hand; grasp left handle with right hand; turn to right, bringing feet together; palms in, handles perpendicular, top of handle level with top of shoulder. *Movement:* Extend arms straight forward, shoulder high, chest well to the front. Times _____.

Exercise No. 24. Position: Back to weights, arms straight back, palms down, move hands forward till handles pass thighs, keeping arms straight. Times _____.

Exercise No. 25. Position: Back to weights, hands over shoulders, elbows bent, palms to front. *Movement:* Straighten arms to front horizontal position. Times _____.

Exercise No. 26. Position: Back to weights, bend elbows, upper arm parallel to floor, hands under arm-pits, palms up. *Movement:* Straighten arms to front horizontal position. Times _____.

Exercise No. 27. Position: Back to weights, palms to front, right arm vertical position over the head, left arm at thigh. *Movement:* Lower right arm and raise left arm to front horizontal position. Change position of hands and repeat. Times _____.

Exercise No. 28. Position: Back to weight, arms bent, elbows at sides, palms to rear, hands height of shoulders, in front of shoulders. *Movement:* Straighten arms to front horizontal position. Times _____.

Exercise No. 29. Position: Back to weights, arms extended to side horizontal position, palms to front. *Movement:* Bring arms forward to front horizontal position. Times _____.

Exercise No. 30. Position: Right side towards weight, right arm side horizontal position. *Movement:* (a) Bring arm down to side. (b) Raise arm to vertical overhead position. (c) Bring arm forward to front horizontal position. Change handle of chest weight to left hand, arm behind body in small of back. *Movement (E.)* Raise left hand to side horizontal position. Change handle to position over shoulder, elbow bent, upper arm parallel to floor. *Movement (F.)* Straighten arm to side horizontal position. Reverse position, left side to weights and execute movements. Times _____.

Exercise No. 31. Position: Right side toward weight, feet apart twelve inches, left hand behind head, elbow bent, hand over shoulder, right hand in front of body, elbow bent. *Movement:* Extend both arms to left horizontal position. Reverse. Times _____.

High Pulleys

- (1) Position: Face the weights, heels together, arms extended, grasp the handles. *Movement*: (a) Pull down alternately with right and left hands, bending the knees with each down movement, and turning the body slightly to right or left. Times _____.
(b) Swing both arms obliquely down to the right (left), bending the body, knees rigid, hands as close to floor as possible. Times _____.
- (2) Position: Back to weights, heels together, grasp handles overhead. *Movement*: Swing arms, holding elbows rigid, forward and downward, bending body forward. Times _____.

Low Pulleys

- (1) Position: Face the weights, heels together, bend forward, bend knees; grasp handles, turn the hands palms upward. *Movement*: Straighten legs and back; bring the handles with bent arms to a position over the shoulders. Times _____.
(b) Bend forward, with legs straight, straighten back and elevate arm to vertical position over head, chest and abdomen well forward. Times _____.
- (2) Position: Stand with back to weights. *Movement*: Elevate handles to vertical position above head. Times _____.
- (3) Position: Lie on the floor on the back, feet towards the weights; grasp handles and hold the hands close to sides. *Movement*: Swing the hands out to the sides slowly, keeping the elbows stiff; swing the arms over the head, hands close to floor, till back of hands touch; take a long, deep breath as the hands go up; exhale as the arms return to original position. Times _____.
- (4) Position: As in Exercise 3. *Movement*: Keeping elbows stiff, elevate arms from the floor to position over the head till back of hands touch the floor, taking a deep breath as arms are elevated. Exhale as arms return to original position. Times _____.

Head Gear Attachment, Chest Weights

- (1) Position: Face weights, hands on hips, *Head gear* attached to weights and head. *Movement*: Allow the head to drop forward, extending chin well forward; bring the head back to position, straightening neck. Times ____.
- (2) Position: Stand with right (or left) side to the weights, hands on hips, *head gear* attached to weights and head. *Movement*: Move the body gently to the left, without bending neck, return to position. Times ____.

Special Apparatus

Traveling Parallels

Position: Place yourself between the bars, back to wall, grasp handles firmly, elbows pointed obliquely backward, head erect, shoulders back, chin drawn in. *Movement*: (a) Push the bars downward until the arms are extended. (b) Allow the bars to *slowly* rise, taking in a deep breath at the same time. (c) Push the bars down *slowly*, at the same time exhaling. Times ____.

Chest Expander

Position: Face the weights, standing under short bar, grasp the handles firmly. *Movement*: (a) Keeping the elbows stiff, bring the arms down *slowly* sideways until the hands touch the legs, exhaling. (b) Raise the arms slowly, inhaling. (c) Bring the arms down slowly in front of body, keeping elbows stiff, exhaling. (d) Raise arms *slowly* in the same direction, inhaling. (e) Bend body backward from knees; keeping the arms straight, extend them sideways to side horizontal position. Times ____.

Chest Developer

Position: Face the weights and grasp the ends of the bar firmly. *Movements*: (a) Bring the bar down (slowly exhaling)

with both hands until bar rests on front of legs. (b) Raise bar to original position, slowly inhaling. (d) bring the bar down (slowly exhaling) in line with the body, bending the arms, push down until the arms are straight, the bar being opposite and close to the legs. (c) Raise the bar to the original position, inhaling. Times ____.

Quarter Circle

Position: Lie with the back on the apparatus; take a full breath and grasp bar firmly, hands the width of shoulders apart, bar across thighs. *Movements:* (a) Elbows stiff, raise arms over head and lower down to sides, holding the breath; exhale after arms are at the sides. (b) Raise the arms slowly to original position, taking a deep breath; hold breath and bring bar down. Times _____. (c) Bring the bar down to back of neck; come forward to sitting position, head erect. (d) Return to position. Times _____.

Wrist Machine

Position: Face apparatus, grasp the roller with both hands, fingers over and thumbs under. *Movements:* (a) Turn the roller towards you. (b) Same, with left hand over and thumb under, right hand under and thumb over. (c) Right hand over and thumb under; left hand under, with thumb over. (d) Both hands under, and thumbs over. Repeat above positions of the hands, turning from you. Times _____.

Inclined Parallels

Position: Stand on the foot-piece, facing apparatus, hold the body rigidly straight. 1 *Movement:* (a) Lunge forward, grasping the bars shoulder high, extending elbows at the sides. (b) Push to an upright position, releasing the grasp of the hands, lower them to sides. Times _____.

2 *Movement:* (a) Stand back to apparatus, two feet from foot-rest, with body held erect; fall back between the bars; grasping them just after the shoulders have passed through. (b) Pull the body back again vigorously, releasing the hands; grasp the bars on the other side as the body passes through. Times _____.

3 *Movement:* Stand facing the apparatus, with toes six inches

from the foot rest, lunge forward and grasp the bars about shoulder high; extend arms forcibly, so as to bring the body to an erect position.

Abdominal Table

- (1) Position: Lie on table, place feet under the rest. *Movements:* (a) Raise body to sitting position, arms at sides. (b) Raise body to sitting position, hands behind neck. (c) Raise body to sitting position, arms extended in vertical position above head. (d) Release feet and raise legs to vertical position. Times ____.
- (2) Position: Lying face down, with forearms on the table under chin. *Movement:* (a) Raise head as high as possible. (b) With hands on hips, heels under rest, curve the back as much as possible. Times ____.
- Same exercise, with hands behind neck, arms extended above head.

Rowing Machine

Position: Sit on sliding seat, place feet in the straps, grasp the oars with the hands, bend the knees, keeping them close together; lean forward as far as possible, with the arms straight.

Movement: Throw the head and shoulders back, straighten legs; bend the arms, pulling the oar back close to the abdomen; the body should go a little beyond the vertical position.

Times ____.

Traveling Rings

Position: Grasp the rings firmly and hang at arms-length, legs straight, heels together, toes pointed toward the floor.

Movement: Begin to swing by pulling alternately on each arm; swing from one ring to another, keeping the body in the same position. Times ____.

Drills

The class drills follow marching and running. Classes take free-hand or setting-up exercises each period of *prescribed work*. The aim in these drills is to improve the health and body education or control of the student. They will increase the strength, grace, skill, endurance, and organic power. The respiration should be deep and full during all class drills.

Free movements, with hand apparatus as follows: Freshmen, Indian clubs; Sophomores, Dumb-bells and boxing; Juniors, single sticks and broadswords. Apparatus, mat work, games, and indoor track in graded squads under student leaders.

Free-Hand or Setting-Up Exercises

To secure the best results, it is essential that the student perform exercises correctly.



Fig. 1.

Correct position of the body: The heels together, with toes turned out angle 60° ; knees straight; hips even, in the same plane, and drawn well back, so as to keep abdomen in; Chest raised, well forward and expanded; shoulders even, in the same plane, drawn back, without being pushed up and without stiffness; arms hanging down to the sides in straight line from shoulders, palms in toward the thigh; head raised even on the shoulders, and chin drawn well in; eyes looking forward; weight of body inclined a little forward, so as to rest on balls of the feet, and *not on the heels*. A line from the crown of the head should fall just in front of the ear, armpit, hip, and knee-cap, to the instep of the foot. (Fig. 1)

Arm Exercises



Fig. 2

1. *Breathing exercise:* Slowly elevate the stretched arms sideways and upward till they reach a vertical position above head. Inhale as arms are raised, exhale as they are lowered. Times _____. (Fig. 2)
2. *Finger flexion and extension:* Open and close hand with force, at side of thighs; at side, arms horizontal; in front, arms horizontal; overhead. Times _____.
3. *Shoulder circling:* The shoulders are slowly moved upward, backward, downward, and forward, so

as to describe a small circle; arms hanging down. Inhale as shoulders go upward and backward; exhale as they go downward and forward. Times ____.



Fig. 3

4. *Arm circling*: Raise arms laterally to horizontal position, palms upward, thumb to rear. Slowly describe a small circle with each arm, upward and backward, from front to rear, the arms not passing in front of the line of the chest. Times _____. (Fig. 3.)



Fig. 4

5. *Arm exercise front to rear*: Raise arms fully extended to front, horizontal position, palms touching, heels on ground. (Fig. 4.) Swing the arms extended to the rear, inclining them slightly downward, raising body on toes. (Fig. 5.) Times ____.



Fig. 5



Fig. 6

6. *Arm rotation*: Take position with elbows bent at right angles, upper arms parallel with floor; (Fig. 6) rotate both arms in the shoulder joints, so as to bring forearms horizontally forward parallel with floor and each other, then carry them back to first position. Times ____.

7. *Arm exercise shoulder front, rear*: Raise arms laterally. Bend the arm so as to bring the hands above the shoulders and close to neck; keep the upper arm horizontal (Fig. 7); keeping the arms at same angle; force the elbows to rear as far as possible. Times ____.



Fig. 7



Fig. 8

8. *Arm flexions and extensions:* Bend arms so fingers can be placed on shoulders, elbows at sides. (Fig. 8.) Extend upward, forward, sideways, downward. (Figs. 5, 4, 2 and 1.) Times ____.

9. *Straight arm circle:* Raise the arms shoulder high (Fig. 3), fingers extended. Swing arms downward and cross them in front of body to position in (Fig. 9), making two circles. Times ____.



Fig. 9

Trunk Exercises

10. *Trunk flexion, forward and backward.* Place the hands on the hips; bend the trunk *slowly forward* from hips, as far as possible, shoulders and head kept well back and the chin in; chest well forward, knees straight. Raise and bend the trunk *slowly backward* as far as possible. (Figs. 10 and 11.) Times ____.



Fig. 10



Fig. 11



Fig. 12

11. *Trunk flexion sideways, right and left.* Hands on hips. Bend trunk *slowly* to right, without twisting or raising either heel. (Fig. 12.) Bend trunk similarly to the left. Times ____.

12. *Trunk circling*: Bend trunk to right as in 11th exercise (Fig. 12); circle towards rear, and bend to rear as in tenth exercise (Fig. 11); continue to bend to left as in 11th exercise; continue to front and bend forward as in 10th exercise. (Fig. 10.) Times ____.



Fig. 13

13. *Trunk forward bend, arms over head*: Raise arms from sides extended to their full length, till hands meet above head, palms front, fingers pointed upwards, thumbs locked, shoulders pressed back. (Fig. 2.) Bend forward till hands touch floor, if possible, keeping arms and knees straight. (Fig. 13). Raise body to vertical position. Times ____.



Fig. 14

14. *Trunk torsion or twist*: Hands on hips. Turn or rotate trunk on hips, as in Fig. 14. Times ____.

15. *Side bend*: Bend body to the side and touch knee, at the same time bringing other hand into opposite armpit. (Fig. 15.) Reverse and repeat. Times ____.



Fig. 15



Fig. 16

16. *Wind-mill movement*: Bend the body forward at right angles with the legs; hold position throughout the exercise. Bend right knee and touch floor with right hand, at same time carrying the left arm upward and forward above the head. (Fig. 16.) Then straighten knee, and carry right hand over head; bend left knee, and touch floor with left hand. Times ____.



Fig. 18

17. *Leg elevation, upward:* Lying on the back on the floor or abdominal table, raise the legs as far up as possible, with knees straight; let them slowly down. (Fig. 18.) *Note:* *Beginners* should use only one leg at a time, or both with knees bent.

Times ____.



Fig. 19

18. *Back curving:* Lying face down on the floor or abdominal table, with hands on hips or neck, bend trunk as far backward as possible. Repeat. (Fig. 19.) Times ____.

19. *Trunk elevation:* Lying on the floor or abdominal table, raise body to a sitting position and repeat. Times ____.

Leg Exercises

20. *Leg elevation sideways, right and left:* Hands on hips; raise legs slowly sideways, knees straight. Times ____.



Fig. 20

21. *Leg elevation forward, right and left:* Hands on hips; raise legs slowly forward as high as possible, knees straight. (Fig. 20.) Times ____.

22. *Knees deep bend:* Hands on hips; separate knees and bend them as much as possible, head and trunk erect, heels raised, weight of body on balls of feet. (Fig. 21.) Raise the body, straightening and closing the knees and lower the heels to the floor. Times ____.



Fig. 21



Fig. 22

23. *Leg elevation backward*: Hands behind head, raise leg as far as possible backward without bending (Fig. 22) trunk or knees; point toes well back and down; keep chest well forward. Times ____.

24. *Heel elevation*: Hands on hips; raise on toes as high as possible; knees straight, heels together. Lower the body *slowly* to the floor. Times ____.

25. *Knee elevation forward*: Hands on hips; raise the left leg to the front, bending and elevating the knee as much as possible; leg from knee to instep vertical, toe depressed. (Fig. 23.) Replace the left foot, and raise the right leg as prescribed for the left. Times ____.



Fig. 23

26. Stationary run.
27. *Breathing exercise*: Same as first exercise. Times ____.

Indian Club Drill

Execute each exercise 8 counts; changes all come on count 8.

Introductory Movements.

1. March to position with clubs suspended at the sides.
2. Raise large ends of clubs against forearms.
3. Raise and cross the forearms in front of chest; upper arms horizontal; clubs resting on the forearms.
4. Extend the arms sideways, clubs still resting on forearms.
5. Extend the clubs.

Drill

1. *Straight arm circle*.
2. *Straight arm circle*; small circle above head.

3. *Double outside*; small circles behind shoulders. Change,—
Carry left hand over the head after (dip) small circle.
4. *Doubles to right side*; small circle behind shoulders.
Change.—Carry right hand over the head after (dip)
small circle.
5. *Doubles inside*; small circles behind shoulders. Change,—
After small circle, on count 8, carry left hand outside.
6. *Doubles to left side*; small circles behind shoulders. Change
after (dips) small circles, continue left hand (dip) small
circle outside with right.
7. *Alternates outside*: Change,—Carry left hand over head
(dip) small circle with right.
8. *Alternates to the right side*; change: On count 8 carry right
shoulder high stops, left hand executes outside (dip)
small circle.
9. *Alternates inside*; change; on count 8 left arm when
shoulder high stops, left hand executes outside (dip)
small circle.
10. *Alternates to left side*; change; left hand omits (dip) or
circle behind shoulder and continues outside swing.
11. *Doubles outside*; one small circle in front of hips. When
making small circles in front of hips, keep arms against
sides, elbows straight. Double (dip) small circle
behind shoulders. Change; after (dip) small circle
carry both arms to right.
12. *Doubles to right side*; one circle in front of hips; two
(dips) small circles behind shoulders. Change;
after (dip) small circle both hands to inside.
13. *Doubles inside*; one circle in front of hips; double (dips)
small circles behind shoulders. Change.—after (dips)
small circles, both hands to left side.
14. *Doubles to left side*; one circle in front of hips, double
(dips) small circles behind shoulders. Change: After
(dips) small circles doubles outside.
15. *Circle clubs parallel to floor*; after lowering arms to sides
bend elbows, so clubs will rest outside of forearms; then
straighten arms out to sides shoulder high, and extend-
ing clubs lower arms to sides, etc. Change: On count 8
clubs will be straight out to sides shoulder high, parallel
with floor. Dip with right, swing with left.

16. *Pendulum right*; club (dipping) small circles behind shoulder. Left club straight arm swing in front of body. Change: Dip with left, drop right arm.
17. *Pendulum left*; club (dipping) small circles behind shoulder. Right club straight arm swing in front of body. Change: Drop left hand to position for circle in front of body. Right hand over shoulder.
18. *Shoulder (dip) small circle*. Right hand dips behind shoulder four counts, left circles in front of hip four counts. Then change left to (dips) small circles behind shoulder and right circles in front of hip. Change: Right hand goes up in front of body without (dip) small circle behind shoulder to circle behind hip.
19. *Doubles outside*: Small circles behind hips; two (dips) small circles behind head. Change: Left arm over head and swing both arms to right side.
20. *Doubles to right side*: Circles behind hips, etc., as in 19. Change: Carry right arm over head after (dip) small circle.
21. *Doubles inside*: Circles behind hips, etc., as in 19. Change: Both arms go to left.
22. *Doubles to left side*: Small circles behind hips, etc. Change: After (dip) small circles behind shoulders, repeat (dip) small circles doubles outside.
23. *Grapevine swing*, with circles behind shoulders outside 16 counts.
24. *Circle behind hip and circle in front of body with one dip behind shoulders*.
25. Same as 24. Doubles to right side.
26. Same as 24. Doubles inside.
27. Same as 24. Doubles left side.
28. *Doubles outside (dip) small circle behind shoulders*; double circle with arms straight; circle in front of body; dips (small circles) behind shoulders.
29. Straight arm circle, 8 counts; on count eight drop clubs to arms across front of body, clubs resting on arms.

Music.—Newtowne Club March, Theseus Club March. Academia Waltzes by Strauss.

Dumb-Bell Drill

Execute each exercise 8 counts, and the alternates 16 counts.

Group 1. (a) Bells at sides of thighs, palms front; twist forearms so that palms face rear; twist back to position; 8 counts.

(b) 1. Bend arms until forearms are front horizontal, palms towards each other. 2, 3, 4, 5, 6, 7 "Rataplan" twist forearms to left, the thumb end of the right bell striking little finger end of left bell.

8. Drop arms to sides.

(c) 1. Raise bells to chest. 2. Push bells to front horizontal position. 3, 4, 5, 6. Twist bells. 7. Bring bells back to chest. 8. Lower bells to sides.

(d) 1. Raise bells up to chest. 2. Push bells to side horizontal position. 3, 4, 5, 6. Twist bells. 7. Bring bells back to chest. 8. Lower bells to sides.

Group 2. (a) 1. Raise bells to chest. 2. Push right arm to over head vertical position, left to side horizontal position. 3. Bring bells back to chest. 4. Lower arms to sides. Repeat four counts.

(b) 1. Raise bells to chest. 2. Push right arm to side horizontal position, left over head vertical position. 3. Bring bells back to chest. 4. Lower arms to sides. Repeat four counts.

Alternate (a) and (b).

Group 3. (a) 1. Raise left bell (arm straight) to front horizontal position; right over shoulder, thumb end down. 2. Strike left bell with right bell, dropping left arm, and raise to position over shoulder, right arm remaining in front horizontal position. 3. Strike with left. 4. Right returns to shoulder. 5. Strike with left. 6. Right returns to shoulder. 5. Strike with left. 6. Right returns to shoulder. 7. Strike with right. 8. Strike with left and let both arms drop to side.

Group 4. (a) 1. Raise bells to chest. 2. Extend right arm to over head vertical position, left down to side. 3. Bring bells back to chest. 4. Lower bells to sides. Repeat four counts.

(b) Same as (a), left bell over head. Alternate (a) and (b).

Group 5. (a) 1. Raise bells to a position over shoulders, elbows bent, upper arms parallel to floor. 2. Straighten arms to side horizontal position and bend knees. 3. Straighten knees and return bells to position over shoulders. 4. Push bells down to sides. Repeat four counts.

(b) 1. Hit bells together over head by raising arms through side horizontal position. 2. Bend knees (body erect) and hit floor by swinging arms through side horizontal position. 3. Straighten knees and hit bells together over head. 4. Swing bells down to sides by keeping arms straight. Repeat four counts. Alternate (a) and (b).

Group 6. (a) 1. Hit bells over the head through side horizontal position. 2. Raise right leg and hit bells under leg. 3. Hit over head through side horizontal position. 4. Hit bells in front of body.

Repeat four counts.

(b) Same as (a) hitting bells under left leg. Alternate (a) and (b).

Group 7. (a) 1. Jump feet apart, bend forward and swing bells between legs. 2. Raise body, return bells to chest. 3. Push bells forward. 4. Return bells to chest (bring feet together). Repeat four counts.

(b) 1. Jump feet apart, bend forward and swing bells between legs. 2. Straighten body, return bells to chest. 3. Push bells to side horizontal position. 4. Return bells to chest (bring feet together).

Repeat four counts.

Alternate (a) and (b).

Group 8. (a) 1. Lunge directly to right side and bring bells up to chest. 2. Touch right bell to floor (elbow against inside of knee) and extend left arm perpendicularly to floor. 3. Bring bells to chest and straighten body. 4. Bring feet together and push bells down to sides.

Repeat four counts.

Same as (a) to left side.

Alternate (a) and (b).

Group 9. (a) 1. Jump feet apart and raise arms to side horizontal position. 2. Rotate to left, arms horizontal position. 3. Rotate back to position count 1. 4. Bring feet together and lower arms.

Repeat four counts.

(b) Same to right.

Alternate (a) and (b).

Group 10. (a) 1. Raise bells to chest. 2. Bend body forward. hit left bell on floor, extend right bell to front horizontal position. 3. Bring bells back to chest, and raise body. 4. Lower bells to sides.

Repeat four counts.

(b) Same as (a), right bell hitting floor.

Alternate (a) and (b).

Group 11. (a) 1. Raise arms straight up to front horizontal. 2. Twist or rotate to right by turning body on hips, arms horizontal position. 3. Turn or twist back to front horizontal position. 4. Lower arms to sides.

Repeat four counts.

(b) Same as (a), twisting to left side.

Alternate (a) and (b).

Group 12. (a) 1. Raise bells to chest and lunge straight to right side. 2. Bend forward and hit bells on floor. 3. Straighten body and bring bells up to chest. 4. Bring feet together and push bells down to sides.

Repeat four counts.

(b) Same to left side.

Alternate (a) and (b).

Group 13. (a) 1. Lunge back and hit bells over head, through side horizontal position. 2. Bend forward, hit bells under right leg. 3. Hit bells over head. 4. Hit bells behind body.

Repeat four counts.

(b) Same, hitting bells under left leg.

Alternate (a) and (b).

Group 14. (a) 1. Raise bells to chest and lunge forward with left foot. 2. Bend forward and place bells on floor. 3. Carry left foot back beside right. 4. Bend arms and lower body down to floor (body straight). 5. Straighten arms (elevate body). 6. Advance left foot to lunge position. 7. Straighten body. 8. Bring feet together and lower bells to sides.

(b) Same, advancing right foot.

Alternate (a) and (b).

Group 15. (a) 1. Brings bells up to chest and step right foot back about 12 inches. 2. Turn body on balls of feet, bend

body, and strike bells on floor. 3. Bring bells to chest and turn body to front. 4. Bring feet together and push arms down to sides.

Repeat four counts.

(b) Same, to left side.

Alternate (a) and (b).

Group 16. 1. Raise bells above head through side horizontal position. 2. Lower them in front of chest and down past thighs, elbows stiff. 3. Raise over head through side horizontal position. 4. Lower the bells through side horizontal position and strike their ends together, hard behind the hips, palms facing rear, shoulders well back. 5. Raise them through side horizontal, and strike them hard at a high vertical position, palms facing front. 6. Lower them through side horizontal, and strike hard in front of toes, knees stiff. 7. Raise them to high vertical. 8. Lower bells through side horizontals and strike them together, hard behind heels, knees stiff. 9. Raise bells and strike them in front of chin, palms facing chin. 10. Strike them together at high vertical position. 11. Strike bells behind hips, palms facing rear. 12. Strike them in front of chin, palms facing chin. 13. Lower to side horizontal position. 14. Strike bells in front horizontal position. 15. Bring bells to chest. 16. Push bells down to sides.

Music.—“Composia” Waltz, “Campus Dreams.”

Broadsword Drill

Manner of holding broadsword: The grip should be firmly grasped, the four fingers together, the thumb along the back of the grip.

Preliminary position: Place the feet at right angles, heels together, the right arm at side, blade in carry position (against shoulder, perpendicular to the floor). Squad in parallel lines about twelve feet apart.

Guard position: Shift weight to left leg, advance the right foot about twice its length, bend both legs, separating them at the knees, so the left knee will be over the left toe, and the right knee over right ankle, hand at height of chest and in

front of right shoulder toward the adversary, nails down, the arm half bent, the elbow standing out to the right a little and about eight inches from the body, point of weapon at height of the eyes, the left forearm resting in small of the back.

Moulinet is executed by making the sword describe a horizontal circle from right to left (or left to right) above the head, holding the hand near the forehead, bending arms in first half of the circle, and straightening it in the second half. *Vertical Moulinet* is a vertical circle executed on the left and right side of the sword arm.

Engagement: Assume guard position, with blades placed edge to edge.

Salute

Squad in parallel lines facing front. Lines numbered 1 and 2. Count 1. No. 1 lowers sword from carry position so that point will be about four inches from the floor, the blade and arm forming a straight line obliquely downward, feet at right angles, heels together, left foot pointed to the front, right foot toward opponent. No. 2 about faces and takes same position as No. 1. Count 2. Both lines carry blades to left hand, keeping arm straight. Count 3. Let go grip with right hand and extend right toward opponent, blade remaining in left hand. Count 4. Return right hand to grip. Count 5. Lunge diagonally to rear. (right) arm straight, blade well above the shoulder. Count 6. Hold position. Count 7. Guard position, tierce engagement, with moulinet and one lappelle. Count 8. Two lappelles. Count 9. Recover backward, drop left arm to side, raise right arm and execute a moulinet to the left. Count 10. Hold position of Count 9. Count 11. Swing blade to rear, rotating on hips, arm well up, and execute a moulinet to the right. Count 12. Hold position of Count 11. Count 13. Execute vertical moulinet left. Count 14. Execute vertical moulinet right. Count 15. Guard position, tierce engagement with one lappelle. Count 16. Two lappelles.

Simple Attacks and Parries.

- (1) *Head cut*: No. 1. Pass the blade over the adverse point, extend the arm, lunge sword cut upon the crown of the head. No. 2. *Parry head cut*. Raise blade to a

horizontal position in front and a little above crown of the head, arm bent and the nails forward. No. 2 returns cut led by No. 1 through drill, each cut being executed 8 counts.

- (2) *Left cheek cut*: No. 1. Pass the blade over the adverse point, extend the arms, lunge, turning the hand to quatre, give the left cheek cut. No. 2. *Parry left cheek cut*: Carry the hand to a position in front of the left chest and four inches from it, the blade pointed upward, slightly inclined forward and inward, the edge toward the left.
- (3) Repeat Head Cut as in No. 1.
- (4) *Right cheek cut*: Similar to No. 2, parry made on right side.
- (5) *Chest Cut*: No. 1. Pass the blade over the adverse point, extend arm, lunge, turning the hand to quatre, give cut for left shoulder downward diagonally across chest. No. 2. *Parry Chest Cut*: Raise the right forearm to a horizontal position in front of body, elbow bent and outside the line of the body, the hand in front of and height of chin, nails forward, the blade hanging downward about six inches from the body and slightly inclined outward, the edge to the left.
- (6) *Girdle Cut*: No. 1. Lower the point of the blade, carry it under the adverse blade, extend the arm, turning the hand to quatre, give the cut across the waist. No. 2. *Parry Girdle Cut*: Similar to parry for chest cut in No. 5.
- (7) *Flank Cut*: No. 1. Lower the arm and lunge, give the cut across the hip. No. 2. *Parry Flank Cut*: Carry the hand to the right a little out of the line of the body, arm slightly bent at the elbow, the hand and elbow at the height of the belt, the blade pointing downward and slightly inward, about 15 inches from body, edge to the right.
- (8) *Thigh Cut*: No. 1. Lower the point, extend the arm, lunge, give cut across the thigh. No. 2. *Parry Thigh Cut*: This cut is parried by an *escape* to rear. Quickly carry the right leg, which is attacked, twelve inches to the rear of left leg, the foot flat on the floor.

- (9) *Point Thrust*: No. 1. Lower point and pass it under adverse blade, extend the arm. lunge, turning the hand so that the thumb shall be underneath, and the edge of the blade upward. No. 2. *Parry Point Thrust*: In high line, use the parry of *Tierce* or *Quatre*, in low line *Seconde*. On Count 8 come on guard. *Tierce* engagement.
- (10) *Change blade from right to left hand*: Hold guard position on counts 1, 2 and 3. On Count 4 bring heels together, keeping knees bent. On Count 5 about face, change blade to left hand and advance left foot to guard position. Hold guard position on counts 6, 7 and 8. Repeat the nine attacks and parries with left hand. *Change blade back to right hand* on 8 counts, reversing change to left hand.
- (11) *Advance and Retreat*: Count 1. No. 1 advances. (Being "on guard," advance right foot about its length, and let the left foot follow immediately after with same length step. Do not change position of body or hand.) No. 2 retreats. (Being "on guard," step the left foot backward about its length, and let the right foot follow with same length step. Do not change position of body or hand.) Count 2. No. 1 leads head cut. No. 2 parries. Count 3. Assume guard position. Count 4. No. 1 retreats. No. 2 advances. Count 5. No. 1 retreats. No. 2 advances. Count 6. No. 2 leads head cut. No. 1 parries head cut. Count 7. Assume guard position. Count 8. No. 1 advances. No. 2 retreats. *Repeat*.

Gain or Step in blow (Girdle Cut.)

Count 1. No. 1 leads *Girdle Cut*. No. 2 steps left foot in front of right, turning body, parries *Girdle Cut*, letting blade hang down behind the back. Place left hand in front of body. Count 2. From position as above described, No. 2 leads *Head Cut*, No. 1 parries *Head Cut*. Count 3. No. 1 leads *Right Cheek Cut*. No. 2 recovers and parries *Right Cheek Cut*. Count 4. Assume guard position. Repeat next four counts. Reverse and repeat eight counts.

Attacks and Parries.

Count 1. No. 1 leads head cut. No. 2 parries. Count 2. No. 2 leads flank cut. No. 1 parries. Count 3.

No. 1 leads left cheek cut. No. 2 parries. Count 4. No. 1 leads head cut. No. 2 parries. Count 5. No. 1 leads chest cut. No. 2 parries. Count 6. No. 2 leads head cut. No. 1 parries. Count 7. No. 1 leads girdle cut. No. 2 parries. Count 8. No. 2 leads chest cut. No. 1 parries. Reverse order and repeat.

Final Salute

Count 1. Both execute moulinet to left, as in No. 9 of opening salute. Count 2. Hold position. Count 3. Both execute a moulinet to the right, as in No. 11, opening salute. Count 4. Hold position. Count 5. Lower blade (keeping arm straight), so point will be about four inches from the floor; one lappelle. Count 6. Two lappelles. Count 7. Raise blade to open position (arm well up to right, feet together, left arm at side) Count 8. Preliminary position (line No. 1 about facing to right.)

Music.—“Russian” March, Theseus March, “Lion Tamer” March.

Foil Drill

Manner of holding the foil: The foil being placed in your hand, place your thumb upward on the convex side of the handle, nearly touching the guard; the fingers are together underneath. The thumb and index finger largely control the management of the foil.

Preliminary Position: Place the feet at right angles, heels together, the right arm at side, foil in carry position (against shoulder, perpendicular to the floor). Squad in parallel lines about 12 feet apart.

Guard Position: Same as guard position in *broadsword drill*, except left arm should be raised to a curved position behind head, with the hand slightly above head.

Salute

Set 1. Squad in parallel lines numbered 1 and 2. Count 1. Lower foil from carry position till the button is at a distance of four inches from the floor. Count 2. No. 1 half

face to left, then both lines elevate the arm and foil to a slanting position above right shoulder. Count 3. Salute opponent by bringing guard of foil to height of chin and looking toward opponent. Count 4. Lower foil to position in Count 1. Count 5. Carry foil to left hand by bending wrist. Count 6. Elevate foil in both hands over the head. Count 7. On guard. Count 8. Two lappells (strike the floor sharply twice with right foot, do not change position of body).

Set 2. Count 1. Recover backward and lower foil. Count 2. Salute opponent by bringing guard of foil to height of chin (perpendicular to the floor). Count 3. Salute to left. Count 4. Salute to front. Count 5. Salute to right. Count 6. Salute to front. Count 7. Lower foil. Count 8. Assume guard position by elevating arm with vertical moulinet in front of body.

Set 3. Count 1. Execute a moulinet, to the left, bring the feet together and straighten knees, and lower left arm to side. Count 2. Hold position of Count 1. Count 3. Turn body, carrying arm to right with moulinet. Count 4. Hold position. Count 5. Lower foil with vertical moulinet, assume guard position, Tierce engagement. Count 6. Two lappells. Count 7. Take distance (lower foil to position shoulder high, arm straight, point toward opponent). Count 8. Elevate foil, carrying arm to the right to slanting position over shoulder.

Set 4. Count 1. No. 1 lunges Quatre with vertical moulinet in front of body. No. 2 holds position as in Count 8, Set 3. Count 2. Both 1 and 2 hold position. Count 3. Both execute moulinet to left. Count 4. Hold position. Count 5. Both execute moulinet to right. Count 6. Hold position. Count 7. Assume guard position, Tierce engagement with vertical moulinet in front body. Count 8. Two lappells.

Set 5. Count 1. No. 1 disengages and lunges Quatre. No. 2 parries with a sharp Quatre. The action of this parry causes the adverse blade to swing around to right, with the aid of the thumb and index finger, to a position above the left shoulder and in line with the ear. No. 2 lowers the point of his foil, till it is in line with belt, nails turned downward. Count 2. Hold position. Count 3. Assume guard, Tierce engagement. Count 4 hold position. Repeat. On Count 7 assume guard. Quatre engagement.

- Set 6. Count 1. No. 1 disengages and lunges. No. 2 parries with sharp Tierce. Foil swings as in Count 1. Set 5, to the left. No. 2 lowers foil as above. Count 2. Hold position. Count 3. Assume guard, Quatre engagement. Repeat. On Count 7 assume guard, Tierce engagement.
- Set 7. Count 1. Both execute moulinet to left, bring feet together and straighten knees and lower left arm. Count 2. Hold position. Count 3. Turn or rotate body, carrying arm to right, moulinet to right. Count 4. Hold position. Count 5. Lower foil in vertical moulinet, assume guard in Tierce. Count 6. Two lappells. Count 7. Take distance as in Count 7. Set 3. Count 8. Uncover (raise foils to slanting position over right shoulder, arms straight).
- Set 8. Same as Set 4, No. 2 lunging.
- Set 9. Same as Set 5. No. 1 and No. 2 reversed.
- Set 10. Same as Set 6, No. 1 and No. 2 reversed.
- Set 11. Same as Set 3, first 6 counts. Count 7. Elevate foil. Count 8. Assume guard position Quatre.
- Set 12. Same as Set 1, except on Count 7 assume guard, Prime engagement.
- Set 13. No. 1 lunges Prime. No. 2 parries. No. 2 cuts over and lunges Seconde. No. 1 parries Seconde. On Count 8 assume guard, Quatre engagement. Repeat 8 counts.
- Set 14. No. 1 disengages and lunges Tierce. No. 2 disengages and returns Quatre. On Count 8 assume guard, Tierce engagement.
Repeat 8 counts.
- Set 15. No. 1 disengages and lunges Quinte. No. 2 parries Quatre. No. 2 disengages and lunges Tierce. No. 1 parries Tierce. On Count 8 assume guard in low line, Tierce engagement.
Repeat 8 counts.
- Set 16. No. 1 cuts over and lunges Septime, No. 2 parries Septime. No. 2 cuts over and lunges Octave, No. 1 parries Octave. On Count 8 assume guard, Tierce engagement.
Repeat 8 counts.
- Set 17. Count 1. No. 1 lunges Prime. No. 2 parries Prime. Count 2. No. 2 lunges Seconde. No. 1 parries Seconde. Count 3. No. 1 lunges Tierce. No. 2 parries Tierce. Count 4. No. 2 lunges Quatre. No. 1 parries Quatre. Count 5. No. 1 lunges Quinte. No. 2 parries Quinte.

Count 6. No. 2 lunges Sixte. No. 1 parries Sixte.

Count 7. No. 1 lunges Septime. No. 2 parries Septime.

Count 8. No. 2 cuts over and lunges Octave. No. 1 parries Octave.

Set 18. Count 1. No. 1 lunges Sixte (high line). No. 2 parries Sixte. Count 2. No. 2 disengages and returns Quatre. No. 1 counters Quatre. Count 3. No. 1 cuts over and lunges Sixte. No. 2 parries Sixte. Count 4. No. 1 lunges Seconde. No. 2 parries Seconde. Repeat.

Final Salute

Count 1. Both execute a moulinet to the left, bring feet together and straighten knees, (Arm well up). Count 2. Hold position. Count 3. Both execute moulinet to right. Count 4. Hold position. Count 5. Lower foil with vertical moulinet. Count 6. Two lappells. Count 7. Uncover. Count 8. Assume preliminary position. No. 1 about facing.

Conclusion

A series of directions covering the laws of health and exercise have been presented, which deal with a student's physical condition; inseparably connected with his physical condition are certain laws of society governing his personal appearance.

The care of one's clothes and one's manners reveal at once a man's breeding. Educated men should know what to wear and how to act. The *condition* and not the quality of a man's clothes determines his breeding, just as the *condition* of an athlete determines his chances of winning or losing in a contest. *Every man should be neat.*

Requirements for neatness: (1) The linen (collars, cuffs, etc.) should be clean. (2) Every man should shave *at least* every other day; hair cut or trimmed every two or three weeks. (3) The shoes brushed every day. (4) Clothes brushed *every day* and pressed *at least* once a week. *Join a valet club.* (5) Sweaters are for use immediately after *exercise*, and not for daily wear. (6) Jerseys are for use while exercising, and not for daily wear.

Schedule for Gymnasium Classes.

Fill in the time appointed for your class. Saturdays from 10 to 12, regular time for making up absences. Class teams may use the gymnasium, when not occupied by regular classes, by making appointments with Director.

Hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9						make up
10						make up
11						
1 30						
2.30						
3.30						
4.30						
7	Freshmen	Sophomores	Seniors	Juniors		Games
8	Seniors	Juniors	Freshmen	Sophomores		

Director's Prescription of Exercise

1 Neck _____

2 Trunk _____

(a) Breadth, Chest _____

Waist _____

(b) Depth, Chest _____

Waist _____

(c) Strength of Back _____

Upper _____

Lower _____

3 Circulation _____

4 Respiration _____

5 Digestion _____

6 Excretion _____

7 Nervous Function _____

8 Special Corrective Work _____

9 Posture and Carriage _____

10 Recreation _____

(a) Forms recommended _____

(b) To be avoided _____

11 General Directions _____

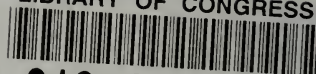
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